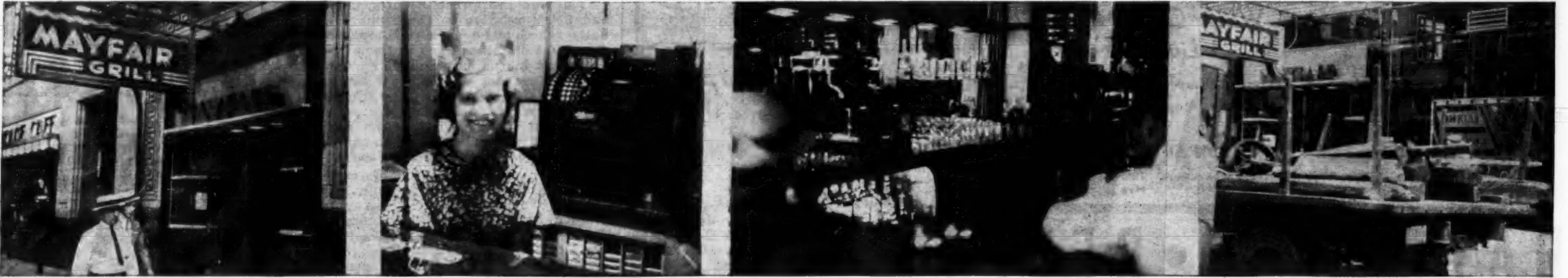


Scene of Chicago Explosion in Which Two Service Men Were Killed



(1) The Mayfair Grill, scene of the accident on July 13 in which two men were killed and seven injured when a compressor which was to have been part of the cafe's air-conditioning system exploded while workmen were checking it for leaks. (2) Cashier's desk at the Mayfair, shaken by the force of the blast. (3) Bottles and glasses were tumbled from their shelves behind the cafe bar when the explosion occurred. (4) Hauling debris away from the scene of the accident. Cafe walls were cracked, and a plate glass show window in an adjoining drug store was broken.

Chicago Lays Plans to License Service Men After Blast Is Caused by Test Methods

(Concluded from Page 1, Column 5) took place prior to the explosion, and as to what gas was used for leak detecting.

Others present at the time of the explosion are being prevented from talking—either by doctors or lawyers. But perhaps we're ahead of the story. Here's what happened:

At 12:05 a. m. Saturday, July 13, some 50 dine-drink-and-dance patrons of the Mayfair Grill, 31 East Monroe St. (it is not in the Palmer House, as earlier reports have stated, but adjacent to this hotel) were driven into the street by an explosion in the basement of the establishment.

Jamerson and Twomey in Grill

Among these patrons were H. C. Jamerson, sales manager of Airtemp, Inc., and W. C. Twomey, secretary of the Chicago Airtemp Corp. Mr. Twomey had left the scene of the installation only a moment before the explosion.

Bottles, glasses, and mirrors were broken and walls cracked as the floor of the grill was rocked by the explosion, declare Messrs. Louis and Ed Weiss, owners of the grill and long-time Chicago cafe operators. Fire Marshal Michael J. Corrigan estimates the damage to the building at \$10,000.

In addition, a plate glass show window in the Walgreen drug store next door was shattered, and the steel door of a freight elevator leading to the Monroe street sidewalk was ripped open.

All Workmen Badly Burned

Answering the fire alarm turned in by a bartender, Marshal Corrigan raced to the scene with firemen and resuscitation apparatus, and removed injured workmen from the basement.

None of those injured suffered abrasions or lacerations from flying debris, as might have been expected following an explosion. All, however, received severe secondary and tertiary burns on their hands and faces. None of their clothing was ignited, or even scorched.

Seven of the burned men were taken to St. Luke's hospital. They were: John Dickinson, 51 years old, 7929 Indiana Ave., Chicago; Richard Kitch, 25 years old, 213 North Harvey Ave., Oak Park; Charles Foster, 45 years old, 4520 Magnolia Ave., Chicago; Art Cunningham, 7649 Stewart Ave., Chicago; Elmer Smith, 1231 East 78th Place, Chicago; Neil Brown, 8038 South Racine Ave., Chicago; and Caswell Waller, regional field man for Airtemp, Inc.

Shortly after being admitted to St. Luke's, Elmer Smith died. Neil Brown, as has been previously mentioned, died nine days later.

The eighth man burned by the explosion is Burt O'Brien, 210 East Pearson St., Chicago, a salesman for Airtemp, Inc. His wife, who was upstairs in the Grill when she heard the roar of the explosion, rushed to

the basement, led him out, and rushed him to Passavant hospital in a taxicab. O'Brien had just entered the room when he was knocked flat by the blast.

Inquest Postponed

A coroner's inquest was opened Monday, July 15, but was adjourned pending such time as the burned workmen had sufficiently recovered to testify.

What caused the explosion? How did the accident occur? A number of theories were immediately advanced. Telling about the explosion on the front page of its July 13 issue the *Chicago Daily Tribune* stated: "All the men were lacerated by flying debris and burned by refrigerating gases, which were liberated by the explosion."

Not Lacerated by Debris

This statement was palpably erroneous. Not only were none of the men "lacerated by flying debris," but they could not have been burned by the "refrigerating gases," for the refrigerant used in the system, Freon, is non-flammable and non-explosive—a fact corroborated both by the Underwriters' Laboratories and the Chicago Boiler Inspection Department after the explosion.

Sabotage, which had been suggested by some who were familiar with the union situation in Chicago, was eliminated as a cause when it was ascertained that union labor was employed harmoniously on the installation from beginning to end.

Reconstructed Story

What did happen? As nearly as it can be reconstructed from talking with persons who arrived at the scene immediately after the explosion, and from examination of the ruins, here is the story:

Friday night, July 12, workmen were checking the piping of the Mayfair Grill's just-installed air-conditioning system for leaks. The equipment had been sold by Airtemp, Inc., to the Mayfair Grill. It consisted of a 15-hp. Universal Cooler condensing unit which had been hooked up to direct expansion evaporators located on the mezzanine floor of the Grill.

Airtemp, Inc., had let a contract for the installation of the equipment to A. C. Fairbanks of Chicago who, in turn, had sublet part of the job to the Brown Refrigeration Sales & Service Co. of that city. Included in this latter concern's work was the testing of the piping.

The Universal Cooler unit had been shipped from the factory in Detroit with a receiver containing 22 lbs. of Freon. Valves at both ends of the receiver were closed; and no Freon was present in the system. The compressor had never been in operation since its arrival.

Neil Brown, who was directing the job, ordered the workmen to attach a cylinder (which is now believed to

have contained oxygen) to the system, and raise the pressure to 200 lbs. Sometime between the explosion and the impounding of the remains by the Boiler Inspection Department, this cylinder disappeared.

Definite statements that oxygen actually was used for the testing—either through carelessness or through ignorance of its explosive qualities when coming in contact with mineral oil—have not thus far been obtained from any of the workmen, although all the available evidence seems to point toward that theory.

Apparently stopped by a cut-off valve, the oxygen (if that's what it was) did not reach the compressor until after a leak had been discovered in a suction line elbow located about 18 in. from the compressor.

Acetylene Leaking Too

Releasing the oxygen pressure, the workmen began repairing this elbow with an acetylene torch. Then, it was found, the acetylene tank was leaking, too, and somehow in the melee of preparing to repair everything, a valve was opened and oxygen was allowed to seep into the compressor—where the oil was.

In quick succession there were two explosions: one when the oxygen and mineral oil united, and one when the mixture of escaped acetylene and oxygen in the room was set off either by ignition or detonation (acetylene can be set off by detonation if the pressure is greater than atmospheric—which was true in this case because of the presence of the oxygen which had been released from the system after the leak had been found).

Results of First Explosion

The first explosion shattered the crankcase and cylinder head of the compressor, bashed in the Freon receiver underneath, and damaged the room. (That the Freon escaped after the cylinder was hit by a steel missile is shown by the concave nature of the break. Had the Freon expelled itself by expanding, the sides of the cylinder would have bulged out.)

First explosion left unharmed the coil standing beside the compressor, and did not even jar off the pulley from the flywheel. None of the workmen were hit by flying metal, although one workman received a bruise which has been attributed to his being knocked to the floor by the force of the explosion.

Second Explosion Caused Injury

It was the second explosion which injured the men. Only their exposed features—faces and hands—were affected by the flash of flame. Clothing was left unscorched. Paper and cardboard containers in the room show no evidences of fire, although the varnish on a door was blistered.

Inasmuch as there are no spots of oil on the floor, walls, ceiling, or apparatus in the building, it is assumed that the oil was entirely consumed in the explosion. Those present who are able to talk have declared that all they smelled at the time of the explosion was a musty odor such as is set up by a dust cloud following an explosion.

The room in which the explosion occurred had no ventilation. It measures somewhere in the neighborhood of 2,000 cu. ft. Doors were open to adjacent rooms. No illuminating gas outlets were in this room, although illuminating gas could be tapped in the kitchen next door.

Illuminating Gas Not Involved

After crumbling the tile walls through to the kitchen, however, the concussive force appears to have spent itself—causing minor and recessive damage in the kitchen, and indicating that illuminating gas could not have been involved.

Moreover, before reaching a 67½ per cent saturation of the air (necessary to permit explosion) the illuminating gas would have overcome the workmen.

On the suit worn by Caswell Waller at the time of the accident were found several black spots, but cleaners believed these to have been caused by contact with the dirty floor when Waller was knocked down, rather than having been incurred directly from something hurled out by the explosion.

Precautions for Handling Oxygen

Refrigeration engineers to whom the accident has been related have agreed that CO₂ should have been the gas used for testing the piping. With regard to the use of oxygen, the following instructions taken from "Precautions and Safe Practices," published by the Linde Air Products Co. (unit of Union Carbide & Carbon Corp.) should settle the matter for all time in the minds of service and installation men:

"Keep oxygen cylinders and fittings away from oil or greases. Oil or grease in presence of oxygen under pressure may ignite violently. Oily or greasy substances must be kept away from cylinders, cylinder valves, couplings, regulators, hose, and apparatus. Do not handle oxygen cylinders or apparatus with oily hands or gloves.

"Oxygen cylinders should never be handled on the same platform with oil or placed in a position where oil or grease from overhead cranes or belts is likely to fall upon them.

"A jet of oxygen should never strike an oily surface, greasy clothes, or

enter a fuel oil tank or storage tank that has contained a flammable substance.

"Always refer to oxygen by its proper name—'Oxygen'—and not, for example, by the word 'Air.'"

WARNING

"A serious accident may easily result if oxygen is used as a substitute for compressed air. Never use oxygen in pneumatic tools, in oil preheating burners, to start internal combustion engines, to blow out pipe lines, to 'dust' clothing or work, or for head pressure in a tank of any kind.

STORAGE

"Do not store reserve stocks of oxygen alongside of reserve supplies of acetylene or other fuel gas cylinders.

"Do not store cylinders near highly combustible material, especially oil, grease, or any substance likely to cause or accelerate fire. Oxygen will not burn, but supports and accelerates combustion and will cause oil and other similar materials to burn with great intensity."

Westinghouse Sales & Profit Up for 6 Mo.

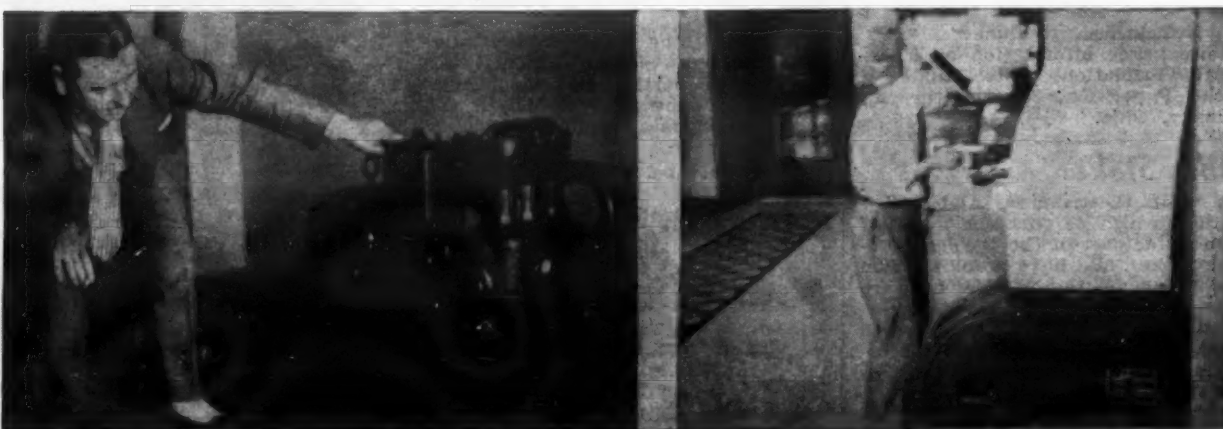
PITTSBURGH—Westinghouse Electric & Mfg. Co. operations showed a net profit of \$3,938,692 for the second quarter of 1935, against \$1,744,427 for 1934, and a profit for the six months ending June 30 of \$6,265,188, against a net loss of \$31,725 in the same period last year, according to the company's statement, just issued.

Orders received during the first six months of the year totaled \$84,984,915, an increase of 21 per cent over last year's figure of \$53,892,610. During the second quarter, orders totaled \$34,222,014, the highest since the second quarter of 1931.

Sales billed during the six-month period totaled \$62,296,017, against \$45,281,590 in 1934, an increase of 38 per cent. Earnings for the six months included \$926,753 profit from the payment of back dividends on, and the sales of, Radio Corp. of America stock.

Operations for the remainder of the year, officials say, should show satisfactory results, although the seasonal peak is past.

Distributor & Contractor Installing Equipment



(1) W. C. Twomey, secretary of the Chicago Airtemp Co., which supplied the air-conditioning equipment, was this near to the compressor about five minutes before the explosion. He and H. C. Jamerson, Airtemp sales manager, were upstairs in the cafe when the accident occurred. (2) A. C. Fairbanks, contractor, to whom Airtemp let the Mayfair job, and who sublet the installation work to Brown Refrigeration Sales & Service Co.

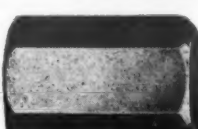
GUMPTION



Some people call it common-sense, others refer to "knowledge," and still others "capacity" while a fourth class designate it as shrewdness.



Call it what you will, the quality exhibited by buyers of Commonwealth Brass fittings is "Gumption" because they have the sense to purchase from a reliable source of manufacture, the knowledge that the merchandise is O.K., that the products have the capacity for which they are rated, and the buyer the innate shrewdness to accept only the best in this line.



It is true "Gumption" to use Commonwealth Fittings.

For more than a quarter of a century discriminating buyers have learned to rely on Commonwealth as their preferred source of Seepage-Proof Fittings. Leaders of the industry know that Commonwealth Fittings are



BUILT RIGHT TO STAY TIGHT

We are now, as always, able to handle any demand for any type and size of fitting for the industry. Hundreds of semi-standard patterns are in stock and we make prompt delivery on specials.



Quotations promptly on specials on receipt of sample, blue-print or sketch.

COMMONWEALTH BRASS CORPORATION

Commonwealth at G. T. R. R.

Detroit, Mich.

Dealer Sales in Twin City Area Show Increase

Country Sales Up 48% as Compared with General Increase of 18%

MINNEAPOLIS-ST. PAUL—Dollar volume of electric refrigerator sales for the first six months in the Twin City area is up 18 per cent as compared with the same period last year, a report just compiled by the Northwest Radio, Refrigeration, and Appliance Association shows.

The survey from which the report was made showed country dealers reporting larger increases than metropolitan retailers, and a separate tabulation showed sales by country dealers to be up 48 per cent, as compared to the general average increase of 18 per cent.

Part of this increase shown by country dealers is accounted for by the fact that many country dealers took on an electric refrigerator line for the first time this year, believes H. H. Cory, secretary of the association.

Only 10 per cent of the retailers surveyed reported a lower sales volume for the first six months of this year as compared with last year.

Total sales to dealers by Twin City refrigerator distributors were 35 per cent greater for the first six months of this year as compared with the corresponding period in 1934, the report showed. Four additional distributors are handling refrigerators that did not have a line last year and all concerns have a much larger dealer organization than they had a year ago, states Mr. Cory.

Only three wholesalers reported a decrease in their sales volume.

At a recent meeting of the Association both wholesalers and retailers reported that sales in the first three weeks in July had been excellent due to the hot weather.

Sales figures collected by the Association do not include sales by mail order houses or from wholesalers located outside the Twin City territory who make shipments into this area.

Inquest on Chicago Blast August 6

CHICAGO—Inquests on the deaths of Neil Brown and Elmer Smith, who died following an explosion in the basement of the Mayfair Grill here July 13 during the testing of an air-conditioning installation, will be conducted jointly Aug. 6.

Previous inquests have been adjourned until other men burned in the accident could have recovered sufficiently to testify. In addition to their testimony as to the causes of this explosion, it is expected that the results of investigations being made by the Chicago Department of Boiler Inspection, Chicago Fire Department, Underwriters' Laboratories, and manufacturers of equipment involved, will be brought out at the hearing.

Some reactions (written, oral, and telephoned) to the story on the accident published in the July 24 issue of ELECTRIC REFRIGERATION NEWS follow:

Gerald Gearon, chief of Chicago Department of Boiler Inspection: "Your diagnosis of the causes of the explosion seems as good as anybody's, and with a few minor exceptions I wouldn't be surprised if much of your explanation will be borne out by the facts which will be revealed at the inquest. The story was well handled."

P. J. Murray, assistant to Gearon: "It's our understanding that the cut-off valve to the compressor was not closed when the testing began, contrary to your story that such was 'apparently' the case. Otherwise your (Concluded on Page 3, Column 2)

336 Electrolux Units Sold In June by One Utility

MINNEAPOLIS—Sales of 336 units during the month of May is the record established by the Minneapolis Gas Light Co., during a 30-day sales drive held here recently. This total represents the largest single month's sales of Electrolux refrigerators in the company's history.

Metal Tubes Are Featured in New Radio Lines of Two Chicago Manufacturers

Grunow Line Also Has Triple Speakers & Resonator

By George F. Taubeneck

CHICAGO—Ranging in price from \$22.50 for a four-tube table set to \$167.50 for a 12-tube console, the 1936 Grunow radio line features a resonator, triple speakers, an "Aladdin Colorflash" clock dial, and metal tubes in most models.

Shown for the first time at a distributor's preview July 26 and 27 at the Edgewater Beach hotel here, these radio models were demonstrated by Engineers M. W. Kenney, H. C. Tittle, and Lt. Commander Fred H. Schnell.

H. C. Bonfig, vice president in charge of sales, Duane Wanamaker, advertising director, James J. Davin, sales promotion manager, and Bill Grunow were the chief speakers at the meeting.

Distributors also heard Meade Brunet discuss metal tubes, Hays MacFarland (head of the advertising agency bearing his name) talk on the market for auto radios, L. A. Woolams discuss company finances, and Vice President Richard Brunsley of the C. I. T. Corp. treat installment selling.

It was announced that C. I. T. Corp., (Concluded on Page 3, Column 1)

Mitchell Will Direct Advertising Dept. Of Kelvinator



S. C. MITCHELL

DETROIT—S. C. Mitchell, formerly advertising manager of the Leonard Refrigerator Co., has been appointed director of advertising and sales promotion for Kelvinator Corp., reports H. W. Burritt, vice president in charge of sales of Kelvinator Corp.

Mr. Mitchell succeeds Vance C. Woodcox, who recently resigned to manage the appliance department of Montgomery Ward & Co.

In his new position, Mr. Mitchell will be in charge of advertising and (Concluded on Page 3, Column 2)

Authority



Richard Brinsley, vice president of C.I.T. Corp. and authority on installment selling, spoke before both the Stewart-Warner and General Household Utilities conventions. C.I.T. Corp. is the official time-payment financing agency on refrigerators and radios for both concerns.

Engineers Confer on Standard Testing of Air Cooling Systems

YORK, Pa., July 30—Engineers from most of the leading manufacturing companies in the refrigeration and air-conditioning industries met yesterday in the York Ice Machinery Corp.'s air-conditioned board of director's room at the plant here to adopt a standard code of methods of testing refrigerating machines and air conditioners.

When adopted, this new code will be standard for the following organizations: American Society of Refrigerating Engineers; Refrigerating Manufacturers Association; National Electrical Manufacturers Association; and the Air Conditioner Manufacturers Association.

Last night the engineers were guests of the York company at a dinner held at the York Country Club and this morning were taken on an inspection trip of York's manufacturing processes in the West York and Grantley plants of the company.

Those attending the conference included: Glenn Muffy, Springfield, Ohio; F. R. Zumbro, The Frick Co., Waynesboro, Pa.; H. M. Williams and J. L. Gibson, Frigidaire Corp.; Dr. L. A. Philipp, Kelvinator Corp.; Chester Lichtenberg, General Electric Co.; W. H. Carrier and B. E. French, Carrier Engineering Corp.; W. A. Grant and R. E. Robillard, Air Conditioner Manufacturers Association; John James and E. R. Wolfert, American Society of Heating and Ventilating Engineers; D. L. Fiske, American Society of Refrigerating Engineers; and T. E. Carpenter, Carbondale Machine Co.

Stewart-Warner to Use New Ferrodyne Chassis in 1936 Models

By George F. Taubeneck

CHICAGO—Plumping wholeheartedly for metal tubes, Stewart-Warner has designed a Ferrodyne chassis to take advantage of the special qualities of this new radio development. The Ferrodyne chassis and metal tubes will be incorporated in all but the smallest models of the 1936 Stewart-Warner radio line.

"Enter the Iron Age of Radio" runs the slogan in the initial advertising messages Advertising Manager Fred Cross has designed to tell the story of metal tubes and the Ferrodyne chassis.

From all over the country Stewart-Warner distributors and their retail salesmen gathered Sunday, Monday, and Tuesday, July 28-30, at the Drake hotel here to see the new line, and hear the 1936 merchandising plans—which include a new bonus plan for retail salesmen.

Salesmanager John F. Ditzell conducted the three-day meeting in rapid-fire fashion, and was on the floor most of the time. F. A. Hiter, vice president in charge of sales, and Fred Cross, advertising manager, were also prominent on the program.

Richard Brinsley, vice president of (Concluded on Page 2, Column 1)

Thompson Appointed Chief Engineer Of Brunner



HARRY E. THOMPSON

UTICA, N. Y.—Brunner Mfg. Co. here has just named Harry E. Thompson as chief engineer in charge of engineering and production.

Mr. Thompson is one of the veteran engineers in the industry in the field of engineering design and production. For two years he was superintendent in charge of engineering for Kelvinator Corp., leaving to join Universal Cooler Corp. when that company was organized.

In the early days of Universal (Concluded on Page 3, Column 2)

'Distress' Price Advertising by Dealers Halted

Detroit Distributors Refuse To Share Advertising Cost on Old Models

DETROIT—To stop dealer advertising of 1934 model electric refrigerators at "distress" prices, nine leading Detroit distributors have informed their dealers that they will share the expense only on advertisements which feature 1935 model units, at 1935 prices.

The distributors' "unwritten agreement," reached informally last month, has spiked dealer concentration on disposal of 1934 stock, and turned attention to aggressive merchandising of current models, except in one or two minor instances.

The move has been most effective where distributors most hoped it would be—in the larger dealerships. Since mid-June, there has been a noticeable absence of advertisements in local newspapers of the "closeout sale" type.

Unseasonably cool weather which stayed with Detroit until the late spring hampered sales here, as in other cities, and some dealers, with large stocks of 1934 models, hastened to sell these in preference to 1935 units, believing that price was the only motive which would affect sales during the abnormal weather.

Another motive for pushing the specially priced 1934 units was the vigorous job being done here by mail-order concerns. These companies were advertising their 1935 models on a purely "price" basis, and other dealers chose their 1934 models, on which prices were more flexible, as the best manner of meeting this competition.

It was to keep this situation from getting out of hand that the distributors stepped in, tightened the purse-strings on cooperation with dealer advertising, and turned merchandising attention back to this year's models.

Dealers, even those with a good many 1934 models on their floors, were quick to follow the distributors' lead, with the result that June and July sales have shown noteworthy gains over previous months.

Industry Sales Drop Slightly in June

DETROIT—Although June sales by industry manufacturers to distributors pushed the total for the first six months well across the million mark and ahead of the total for the first half of 1934, the June figure itself showed a slight decrease from that of June last year.

According to a preliminary estimate made by ELECTRIC REFRIGERATION NEWS, sales of household electric refrigerators by manufacturers to distribution outlets this June amounted to 174,860 units, as compared to a total of 187,600 for the corresponding month of June, 1934, a decrease of about 7 per cent.

June shipments of household electric refrigerators by 14 members of the Household Refrigeration Section of the National Electrical Manufacturers Association (Nema) totaled 159,127 units.

This compares with a total of 170,544 refrigerators reported shipped by Nema members in June, 1934.

The complete report for June appears on page 7.

Fairbanks-Morse Appoints 3 Texas Distributors

CHICAGO—Three Texas companies have recently been added to the distributing organization of Fairbanks-Morse Home Appliances, Inc., of this city.

New distributor for southwestern Texas, southern New Mexico, and the state of Arizona is the Albert Mathias & Co., El Paso, Tex. E. H. Krahn is president of the Mathias company.

The McClintock Sales Co., Dallas, Tex., owned by S. M. McClintock, is distributor for northern Texas.

The E. J. Hermann Sales Co., 1211 E. Houston St., San Antonio, Tex., was appointed Fairbanks-Morse distributor for southern Texas. E. J. Hermann is president of the company.

Specialty Selling Methods for Dealers Will Be Featured In Four August Issues of the News

Beginning with the next (Aug. 7) issue and continuing through the other three issues in August, ELECTRIC REFRIGERATION NEWS will "spotlight" specialty selling methods, devoting the greater part of its editorial columns to reporting the plans, campaigns, and promotional stunts employed successfully by dealers in selling refrigerators this summer.

This year seems to present an opportunity for a realization of the industry's long-hoped-for dream of an extension of the selling season through the month of August. Reasons for this, as pointed out in an editorial in last week's issue are: (1) people are buying; (2) hot weather is here at

last; (3) time payment terms are lowest in history; (4) mail-order boxes are out of the market; (5) present models offer replacement opportunity.

ELECTRIC REFRIGERATION NEWS proposes to do its share toward prolonging the selling season this year with its series of four special issues devoted to specialty selling methods, presenting detailed reports of operating methods employed by successful dealers, together with practical studies of promotion methods used effectively this summer.

Ideas for compensating and rewarding salesmen for extra effort during a special campaign will be considered. Complete outlines for

sales contests are scheduled for publication.

Also in these four August issues will appear the most useful installments of Editor George Taubeneck's story about the development of the specialty selling formula (told in terms of the life of John Patterson, the "Father of Modern Specialty Salesmanship"). This study delves into the origins of such integral features of modern electrical appliance distribution as the sales contest, sales convention, sales manual, standard sales presentation, guaranteed territory, "using the user" plans, dramatized selling, and field sales supervision.

Stewart-Warner Executives Discuss Plans for Merchandising New Radio Line



Hot weather means business to Stewart-Warner executives—and Stewart-Warner executives mean business in hot weather. (1) John W. Ditzell, sales manager, prepares to scuttle sales records with the 1936 Ferrodyne radios. (2) "Our plans are ready—and on Aug. 1 we go into action." (3) Charles D'Olive, assistant to the vice president in charge of sales, says the new S-W bonus plan will pile up business. (4) "We've put a lot of thought into this campaign," says President Joseph E. Otis. (5) "Coupled with refrigerator sales, it should give salesmen a nice income."

Metal Tubes Will Be Used in Nine New Stewart-Warner Radio Models

(Concluded from Page 1, Column 4)
C. I. T. Corp., which will continue in 1936 to be the Stewart-Warner installment sales financing agency, elucidated solutions to knotty problems which arise in handling time payment paper.

Although no official banquet or dinner was scheduled, most of the distributors gathered nightly in the Drake's Silver Forest Room to talk business and listen to the music of Horace Held's Brigadiers, who play on the Stewart-Warner radio programs.

Twin features, the all-metal tubes and the Ferrodyne chassis, are combined in the 1936 line in models ranging from a four-door, 11-tube console to small, compact, table cabinets.

Three 11-Tube Models

Leading the line is the 11-tube chassis, employed in models 1385, 1386, and 1388. Application of metal tubes and glass tubes has here been developed to a high efficiency, assuring world-wide range and "one station at a time" short wave reception. Eight metal and three glass tubes are used.

Featuring these models is the inclusion of a love-wave band above broadcasting, covering 750 to 2140 meters, or 140 to 400 kilocycles. Standard American stations are covered in a second band, 545 to 1750 kilocycles, and short waves in two bands, one spreading from 1800 kilocycles to 5.9 megacycles, and the other from 5.75 to 12 megacycles.

A color-dot indication on the band switching knob indicates in which band one is tuning, the color dots matching the colors in which the tuning ranges are printed on the dial.

'Diffusalite' Dial in Big Models

Another new Stewart-Warner development, on the 7-to-11 tube models, is the "Diffusalite" dial, two bulbs spreading the light evenly over the whole tuning dial, to eliminate glare. Two-speed tuning is provided, a coarse adjustment of 8-to-1 for rapidly covering the scale, and a precision control of 40-to-1, essential to finding short wave stations.

Two concentric knobs, operated independently, provide a dual tone control, the one regulating the pitch of notes in the high range, the other regulating those in the lower register. Volume is controlled automatically, and a doublet antenna input system

is included, to permit a hook-up for better short-wave reception.

Model 1388 is a four-door console of modern Hepplewhite design. Center doors are of walnut, with pencil-striped pilasters and an arch of burl maple. End doors (behind which are shelves) are India wood with a defined stripe and mottle, above which is an inlay band of French rosewood topped with burl maple. It has twin dynamic speakers, 14 in. and 5 in. Dimensions are 37 in. high, 40 in. wide, and 17 in. deep.

In model 1386, a two-door console, doors are of walnut, with the upper arch of Carpathian elm. Walnut pilasters are inlaid with a border of fiddle-back mahogany. An imported marquetry inlay is inserted in the solid walnut strip above the doors. The unit has a 12-in. speaker, and its dimensions are 43x25x15½ in.

Model 1385, an open-face console, has a center panel of California crutch walnut, with an overlay of pencil-striped walnut framing both panel and grille. End pilasters are curved and run from the base up to and across the top. Dimensions of this unit are 41 9/16 in. x 26½ in. x 13½ in.

Features of 9-Tube Chassis

The 9-tube chassis, in models 1375 and 1376, has "four-band" tuning, "Diffusalite" dial, two-speed tuning, automatic volume control, variable tone control, and the doublet antenna input system. This chassis uses six metal and three glass tubes.

Model 1375 is in a modern Hepplewhite console of matched walnut woods. The grille is recessed, with a center panel of pencil striped walnut. Reeded details are on the round corner posts and above the dial panel, and the base is fluted. Dimensions are 40½x24x13½ in.

Model 1376 is of matched walnut and Carpathian elm woods, the pilasters having flutes which run from the base and receding out into the side panels. Grille and center panel are framed within a walnut border, and legs have a reeded effect. Dimensions of this model are 39½x24x13½ in.

In the 7-tube chassis, used in models 1361, 1362, 1365, and 1366, "three band" tuning is provided, with color-dots indicating the band being used. "Diffusalite" dial, two-speed tuning, and other deluxe features are incorporated.



(1) Charles D'Olive spends his days working with sales problems, campaigns and policies. Here he is leaving his office. (2) Home. Now for a shower, dinner, and a quiet evening—with his family and friends.

porated. Distinguishing this series is the use of metal tubes throughout.

Models 1361 and 1362 are of table size. The front panel and top of the former are of India wood, with fluted pilasters, and topped by inlays of walnut burl. The cabinet is 19½ in. high, 14½ in. wide, and 10½ in. deep. The latter has an "off center" dial, with panel of burl walnut. Grille, top, and sides of lighter wood contrast with the black fluted base. Dimensions of this model are 13 in. x 18½ in. x 10½ in.

The larger models, 1365 and 1366, are of matched walnut and maple woods, with curved pilasters, with mahogany and walnut inlays. The first is 38½ in. high, 23 in. wide, and 12½ in. deep, and the second 38 5/16 in. high, 24½ in. wide, and 13½ in. deep.

5 and 6-Tube Models

One model, 1345, is in the 6-tube chassis. This line, as well as the 5-tube series, has "two-band" tuning, one (standard) dial covering regular broadcast ranges, and the other police, aircraft, amateur, and foreign channels. Tuning ratio is 26-to-1.

In model 1345, vertical lines flank the center panel, and are carried around the sides of the cabinet. Pilasters are of figured walnut, and jet black lacquer striping provides needed contrasts.

Models 1301 and 1302 in the 5-tube series are table size, of walnut with antique fluting, beaded moulding, and unusual grille treatment their most distinguishing features. Model 1306, a console has a panel and grille of figured stump walnut and rosewood, with moulded pilasters.

Simplicity of design is the motif of model 1401, a table size cabinet. Grille and panel are of figured, quarter walnut, top and sides of solid red gum. Recessed and moulded parts are antiqued, and back base is fluted. The unit carries a 6-in. speaker.

Radio Bonus Plans

Outstanding among Stewart-Warner's 1936 merchandising plans, which include a wealth of dealer advertising and promotional literature, ranging from posters to price-tags, is the radio bonus plan for retail salesmen.

Purpose of the plan is to encourage greater effort on the part of salesmen by paying a bonus for sales of the various models, over and above the regular salary and bonus paid by the dealer. Under this plan, the bonus is paid by the distributor direct to the retail salesman.

Bonuses for radio sales range from 50 cents, for model 1301, to \$10, for model 1388. The complete bonus scale is: models 1301 and 1302, 50 cents each; models 1306, 1345, 1361, and 1362, 75 cents each; models 1365 and 1366, \$1 each; models 1375 and 1376, \$1.50 each; models 1385 and 1386, \$2 each; and model 1388, \$10.

The plan becomes effective Aug. 1 (Thursday), and continues until further notice. Unless otherwise noted, bonuses will be paid only for sales of the models listed above.

Any franchised Stewart-Warner dealer, and members of his regular sales force, are eligible for the bonuses. A stipulation, however, is that he must have signed a new

franchise on or after Aug. 1, and that it must be approved by the distributor and the factory. In addition, he must place an order for at least seven different model radios, of which 40 per cent are of "Ferrodyne" type.

Approved dealers and their salesmen are to be notified of their eligibility for the contest. Applications for bonuses must cover a minimum of three retail sales, and can apply only to models shown in the bonus schedule.

Upon receipt of applications for bonuses, the distributor, after checking to determine the dealer's or salesman's eligibility, writes his own check in favor of the salesman or dealer, and mails it to him. The distributor then fills in the form, showing amount paid, date, and check number, and turns it into the factory, where, after being checked and audited, a credit memorandum for the amount he has paid out is returned to him.

Method of Getting Bonus

Salesmen applying for bonuses must do so in duplicate, the distributor sending one copy to the factory with his request for credit, and retaining the other until cleared by the factory's credit memorandum.

Sales made prior to Aug. 1, as well as sales of models not included in the bonus schedule, will not be considered for bonus earnings.

Other dealer sales helps include consumer presentation folders, prepared newspaper ads and publicity material, a roto tabloid, "Radio Topics," outdoor posters, window display materials, a framed glass sign, attractive price tags, a simplified radio log, to sell for 5 cents, and "The All-Star Round-Up," a World Broadcasting System transcription available for use over local radio stations.

Goodenough Says Dealers Should Compete with Own Achievement

BETHLEHEM, Pa.—Expressive of the policy that dealers should compete with their own achievements rather than with other members of their business family, was the action of the Goodenough Piano Co., Westinghouse dealer here, in congratulating a newly appointed Westinghouse dealer on obtaining his franchise.

Announcement of the appointment of A. S. Riland appeared in the local newspaper. On the same page the Goodenough Co. took space to congratulate Mr. Riland.

Forster Will Manage Winne Sales Co.

MINNEAPOLIS—F. A. Forster, formerly sales manager of the Winne Sales Co., refrigerator and radio distributor here, has been named general manager of the company following the death of Claude A. Winne, late president of the distributor firm. The appointment was made by Mrs. C. A. Winne who succeeds her husband as president.

Shapiro Takes Over Grunow Distribution In Baltimore Area

BALTIMORE — Shapiro Distributors, Inc., one of General Household Utilities Co.'s leading distributors in New York state, has taken on the distributorship for Grunow products in the Baltimore and Washington, D. C., areas. The organization has established headquarters here at 211 Pleasant St., and in Washington at 1527 M St., N. W.

The Baltimore office will serve dealers in Metropolitan Baltimore and the whole of Maryland, with the exception of the Eastern Shore. Working out of the Capital, the other office will cover the District of Columbia, Virginia, and West Virginia.

Harold Gabrilove, with a background of Grunow selling experience that dates from the company's inception, will be general manager of the organization, with headquarters in Washington. His work will be largely confined to that territory.

Sales manager is Moe Kreisel, who will also be in charge of the Baltimore division. For the present, Mr. Kreisel will devote special effort to dealer promotion work in and around Baltimore.

George Levitt, formerly associated with the Baltimore branch of Frigid-Aire Corp., and Detroit Vapor Stove Co., will assist Mr. Kreisel in handling dealers outside the Baltimore metropolitan area, and Edward Denham, formerly with Barber & Ross, will assist Mr. Gabrilove with the Washington territory.

Lawrence Mezz is credit and office manager of the organization.

The service department has been placed in charge of Max Schwartz and Natie Brown, assisted by a group of factory-trained repair men.

Dealers in the Baltimore trade territory will be formally introduced to the new distributors Aug. 9, at a dinner meeting at Maryland Country Club, and those in the Washington, D. C., area on Aug. 12, at the Kenwood Country Club.

Officers of the Shapiro organization, with headquarters in Newburgh, N. Y., are Hyman Shapiro, president; Sam Kreisel, vice president; Mr. Gabrilove, secretary; and Moe Kreisel, treasurer.

In addition to Grunow refrigerators and radios, the Shapiro organization is also distributor for 1900 Washers.

Sales in Jubilee Higher Than 1934 Record

NEW YORK CITY—Sales at the end of the 33 days of the 42-day Jubilee Load Builders' Campaign, conducted by the Associated Gas & Electric Co. here, totalled 18,417 electric units, or 72.5 per cent of quota, and 1,014 gas units, or 62.6 per cent of quota, as compared with 18,071 electric and 677 gas units for the entire campaign period last year.



The ARRIVAL of a COMPLETELY NEW 'LITTER'

Here's cooling news for August Dog Days. A complete new line of American Engineering Co. low-cost, low-pressure refrigerating units is now ready for immediate shipment. Compact, Self-

contained, attractive. For commercial refrigeration or air conditioning. For Methyl Chloride or Freon. Complete range from 1/4 to 15 h.p. Write for details today.

New York
Boston
Cincinnati
In Canada—Affiliated Engineering Corporations, Ltd., Montreal.



(Note: Exclusive territories are still available for these new A-E-Co machines, A-E-Co ammonia compressors and Hydro-Thermal Cooling Grids).

AMERICAN ENGINEERING CO.
2404 ARAMINGO AVENUE PHILADELPHIA, PA.

New Grunow Radios Use Metal Tubes, Triple Speakers

(Concluded from Page 1, Column 2)

the official time-payment financing agency for Grunow refrigerators (as well as many others), will handle Grunow radio instalment paper also.

Harold Sutherland of the Federal Housing Administration declared that there is a potential shortage of 1,500,000 houses in the United States. Normally, he stated, some 350,000 new houses are built each year in this country; but for the last five years the new house construction figures have been running less than one-tenth of this number.

Specifications for nearly all new houses now include air conditioning, Mr. Sutherland said.

"We are coming to an end of the cycle of restlessness which followed the World War," he concluded, "and are entering an era of home life, peacefulness, contentment, and prosperity."

"Efficiency Theme" on Refrigeration

Except for informal round-table discussions, refrigeration did not enter into this convention as a program subject. Mr. Bonfig declared that factory and warehouse stocks of Grunow refrigerators would be entirely cleaned out before the end of August. Mr. Wanamaker discussed the new "efficiency" advertising theme—based on the theory that the low pressures made possible by the use of Carrene permits operating economies—and stated that it would appear more and more in his advertising messages.

A. G. Messick, who with G. A. Ball and Mr. Grunow form the executive committee of General Household Utilities, led distributors on a night club party Friday night.

Heading the new Grunow radio line is the 12-tube console, priced at \$167.50 (all-world antenna system \$5 extra on all models). "Tone features" in this model include the resonator, triple speakers, push-pull triode class "A" power audio system, full auditorium output, variable selectivity, new condenser type tone control, full-floating condenser gang, oversize power supply system and bass compensation, synchro-dynamic speaker.

Receiver on this model includes a balanced superheterodyne circuit with metal tubes, power line interference eliminator, radio frequency stage ahead of first detector, completely shielded circuits, interference-free intermediate frequency, and multiple deck band switch.

All-Wave Band

For all-world reception this model has an all-wave band, signal beacon, "Aladdin" colorflash dial, clock-face dial, and dual ratio velvet tuning drive.

Cabinet is of modern design with roll-over top front, center portion being of matched stump walnut, side bandings set in with 45° striped walnut, end banding of herringbone striped walnut.

Priced at \$137.50, the 11-tube model 1171, next in the line, has all the features named above except the triple speakers and the octave balance and selectivity control. Cabinet in same design has California walnut finish.

Next in the line is the 8-tube model, which has all the features of the 1171 except super hi-fidelity, 15 watt audio system (equipped with push-pull pentode class "A" power audio system instead, and variable selectivity).

The 6-tube console selling for \$69.50 is very much like the 7-tube set but it doesn't have the Grunow "morning glory" speaker, interference eliminator, intermediate frequency transformer, signal beacon, or the "Aladdin" colorflash dial or self-indicating band switch. Its receiver gives American and foreign reception. Cabinet finish is in center matched stump walnut and striped walnut.

Console models 641 and 581, selling for \$59.95 and \$49.95, respectively, have American and foreign all-wave reception, but do not have the resonator. Cabinets in these models are plainer, but are of walnut finish.

Top among the 1935 Grunow table model radios is the 6-tube model 640, priced at \$49.95. It has many of the features of the larger consoles including new-type tone control, acoustically designed cabinet, full-floating condenser gang, oversize power supply system and bass compensation, synchro-dynamic speaker, balanced superheterodyne circuit, all-wave band, and clock-face dial. Cabinet is squared off, with roll over top effect.

Model 580 is very similar to model 640. It has a 5-tube receiver and lists at \$39.95.

The next model, 520, is of a different cabinet design, and has a 5-tube receiver with automatic volume control, handling standard American broadcast and police band. Price of this model is listed at \$29.95.

Smallest in the line is model 470, a 4-tube receiver for American broadcast and police bands, selling at \$22.50.

Inquest on Explosion In Chicago Set For Aug. 6

(Concluded from Page 1, Column 1)

investigation seems to check with all the information we can develop."

W. W. Rhodes, Kinetic Chemicals, Inc.: "Please let me compliment you on the accurate account of the Mayfair Grill accident which appears in the current issue of your paper. This is a fine piece of reporting."

A. H. Nuckolls, Underwriters' Laboratories: "I think your theory that a second explosion immediately following the first was caused by the presence of another gas such as acetylene must be substantially correct. However, your suggestion that this gas could have been set off either by ignition or detonation probably does not obtain; ignition could have set off this second explosion, but I do not believe detonation could have been a factor."

E. J. Chapman, Ampex division of Chrysler Motors: "I wish to register a protest against your story on the Chicago explosion. The article may have been constructive and informative from the angle of warning service men about improper testing methods, but you shouldn't have dragged the Airtemp name into it, both in print and in picture."

Lester Keilholtz, air-conditioning engineer, Chrysler Motors: "Mr. Staley and other Chrysler officials wish to congratulate you on the Chicago explosion story. We are all in agreement that the best thing to do was tell the whole story."

Tom Pendergast, Universal Cooler: "I should like to express my approval of the article published in ELECTRIC REFRIGERATION NEWS on the Chicago explosion. The job was well done from every angle."

Commercial Machine Group Abandons 'Skeleton' NRA

CHICAGO—Abandonment of the "skeleton" NRA setup as of doubtful value, but continuation of the fair trade practice features of the former code as sound business practice was voted by members of the Commercial Refrigerator Manufacturers Association at their recent annual meeting.

Rather than accept the doubtful benefits of the present NRA structure, CRMA members decided to establish a cooperative program of their own, retaining those features of the old NRA which had been proven advantageous. A majority of the manufacturers, it was pointed out, had been observing fair trade practices regardless of the code program.

A second important step taken by the convention was ratification of the recommendations of the joint relations committee on commercial refrigeration, composed of two members of CRMA, RMA, and Nema Refrigeration Division.

Present officers of the organization, already veterans of two years' service, were drafted for another year. They are:

E. L. Stultz, Viking Refrigerators, Inc., Kansas City, president; E. E. McCray, McCray Refrigerator Sales Corp., Kendallville, Ind., vice president; C. V. Hill, Jr., C. V. Hill & Co., Trenton, N. J., treasurer; and Paul H. Sullivan, executive secretary.

Executive committeemen are J. I. Holcomb, Holcomb & Hoke, Indianapolis, and W. C. Whitchee, "Dry-Kold" Refrigerator Co., Niles, Mich.

S. C. Mitchell to Direct Kelvinator Advertising

(Concluded from Page 1, Column 2)

sales promotion activities for all of Kelvinator Corp.'s products, including domestic and commercial refrigeration equipment, oil burners, electric ranges, and air conditioning.

A native of Tennessee, Mr. Mitchell joined the Kelvinator organization in 1932 after considerable experience in the automobile industry. From sales manager of the Kelvinator branch in Buffalo, he was made special field representative and later became a district sales manager for Kelvinator Corp. He went to the Leonard Refrigerator Co. in the fall of 1933.

Thompson Made Chief Engineer of Brunner

(Concluded from Page 1, Column 4)

Cooler Corp. he had charge of engineering and production, and in the last several years previous to 1934 he was chief engineer. During this time he designed a number of commercial refrigeration products.

Leaving the Universal Cooler Corp. in 1934, Mr. Thompson became a consultant for Sparks-Withington Co. on the manufacture of Spartan household refrigeration compressors, and for Chrysler Corp. on air conditioning.

Sales Idea of the Week

By V. E. Vining, Director of Department Store Sales,
Westinghouse Electric & Mfg. Co.

"Public Bore Number One"

Has, and always will be the man who insults your intelligence by explaining too much.

You know him as well as I do.

He tells you stories that might be good if he didn't drag them through long minutes of irrelevant detail and then—explain the point.

When you tell a story he always says:

"I heard it this way."

When he tries to sell you anything he takes it for granted you have the intelligence of a child of five. He points out the obvious and then explains—explains and explains—until you don't know whether to scream or merely throw him out the window and tell the Lord he jumped.

In extreme cases men have even been known to give him an order—to get rid of him.

Even in the Army—I had a fox-terrier pup—named—"Mabel."

A trip through the cantonment with Mabel at my heels was a liberal education in human nature and the psychology of folks who just must explain.

Even the guy who sold me the dog-collar explained, with all the assurance of a man highly experienced in canine sex life, that Mabel most certainly was not the kind of a dog to be—

Named "Mabel."

Gambill & King Win Awards for Leading Crosley Distributors

CINCINNATI — Wheelless Gambill, Gambill Distributor Co., Nashville, Tenn., and George King, vice president of the Stimson Sales & Investment Corp., Wichita, Kan., have been awarded engraved gold emblems for having made the greatest volume of Crosley sales so far in the 1935 season.

Mr. Gambill's award was in recognition of his firm's sales of Shelvador electric refrigerators, and Mr. King's for sales of Crosley Icyballs.

Neil Bauer, Crosley field sales manager, presented the medals at a distributors' banquet held recently at the Netherland Plaza hotel.

Lehman Wood Joins G-E at Cleveland

CHARLOTTE, N. C.—Lehman Wood, formerly sales promotion manager for L. W. Driscoll, Inc., G-E distributor of this city, has joined the advertising department of the General Electric Co., at Nela Park, Cleveland.

Before assuming his new duties, Mr. Wood will do some special promotional work in New York City for several months. Miss Katherine Nash, who has been Mr. Wood's assistant for two years, is now sales promotion manager for the Driscoll organization.

Anchor Lite to Handle New Range Line

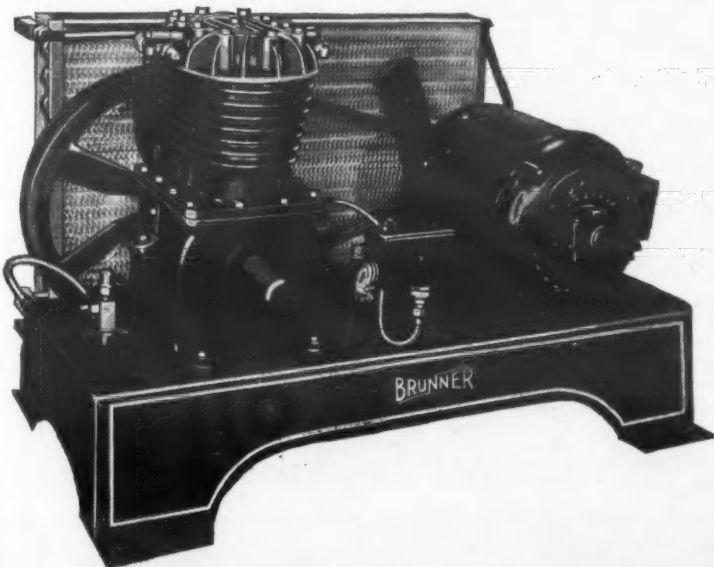
PITTSBURGH—Anchor Lite Appliance Co. has been appointed exclusive wholesale distributor in this territory for Round Oak gas and coal ranges.

Smooth RUNNING



REMINISCENT of the fleet, velvet-footed antelope! Brunner refrigeration units, intelligently engineered for smoothness of operation, naturally embody the counterpart of this advantage, namely, minimum frictional losses through wear. In other words, Brunner's smoothness means enhanced refrigerating efficiency and negligible repairs in years to come.

The 1935 Brunner line, marked by large size compressors, Silver Domes (scientifically finned cylinder heads) and other improvements, offer you a dependable answer to compressor and highside problems. Eight models of dependable compressors, 41 efficient highsides—air and water cooled units—gasoline engine or electric—in a range from 1/6 H. P. to 15 H. P. May we send you our new catalog with full data and specifications? Write: Brunner Manufacturing Co., Utica, N. Y., U. S. A.



The Brunner Commercial Model; Dependable—Carefree—Economical. Two cylinders. Air or water cooled. In a range from 1/4 H. P. to 2 H. P.

Brunner

A NAME BUILT BY 29 YEARS OF SERVICE

PERSONALITIES

By George F. Taubeneck

The 'Why' of This Story

The third instalment of the editor's story on the Development of the Specialty Selling Formula by John H. Patterson, founder of the National Cash Register Co., appears on this page.

Readers of this serial story who knew John Patterson are invited to submit anecdotes about Patterson and his methods—incidents which might be illustrative of any of the material they may read herein. These anecdotes will be incorporated into the general story, with full credit given to those who send them in to us.

Birth of 'Using the User'

The man who bought a National cash register was not through serving his usefulness to the company when he had paid for his machine. The president early made one of his basic business principles a home-made maxim that had direct bearing upon purchasers. "If you want to get new users," he would say, "keep in touch with the old users."

Salesmen thoroughly disliked the policy, and said so. They called it a "waste of time" to call back on purchasers. They declared that there wasn't enough time each day to call on prospects—certainly none left over for calls on customers.

So began Patterson's struggle to convince his salesmen that it did pay to call on users. He had learned from his brief experience in the coal business that a satisfied customer is a company asset of immeasurable value, and he didn't—as usual—permit the objections of the entire remainder of his organization to dissuade him from his purpose.

As a part of his scheme to get his sales force to use the users, Patterson introduced the "birthday book." When a storekeeper bought a register, his name and the date of purchase were recorded in the book. Included was a notation stating when the machine might possibly be traded in on a new one.

This device, of course, was but the beginning of a long series of schemes and stunts calculated to get the salesman back to the premises of the customers who were now using National cash registers. This estimate was based upon the salesman's study of the purchaser's business, and its likelihood of growth and prosperity. Thus the salesman was reminded, by a series of dates in a little book, when a call-back might prove profitable.

Salesmen had balked at practically every innovation Patterson had attempted, notably the training school for salesmen; but generally wound up strong boosters for whatever it was John H. was trying to put over. They objected vociferously at contacting users; and, as before, they soon became "using the user" enthusiasts.

Mr. Patterson insisted on emphasizing this phase of specialty selling at every opportunity. Once, to stimulate the interest of his salesmen, then in convention, he cabled from Europe: "How can we increase sales? Make satisfied users. Always remember our work is not over with the last payment."

It was not only the satisfied users, but the dissatisfied as well, who were employed to useful advantage by the company. Salesmen had instructions from the president to: "Send in complaints. They are our school books from which we learn what is needed, and how to remedy the difficulty."

Many years later the General Electric Co. ran this policy clear out to the end of the line when its Monitor Top refrigerator was introduced. Every time something went wrong

with this machine, the entire mechanism (which is a hermetically-sealed unit) was shipped back to the factory, instead of being serviced in the field. Thus the factory engineers soon learned—after having to fix plenty of them—just what could go wrong with their machine, and were able to "get the bugs out" in remarkably short time.

So successful did the policy of "using the user" become that many of Patterson's former employees took it with them when they left N.C.R. It is probable that the famous Packard slogan, "Ask the Man Who Owns One," is traceable to this source, for Alvan Macauley, Packard president, was once an N.C.R. man.

Much of the early success of Edward H. Jordan, a former N.C.R. employee, in marketing the once-famous Jordan automobile, has been attributed to his slavish devotion to the Pattersonian belief that the salesman's best prospects are obtained from satisfied users.

Others, like the highly successful Thomas H. Watson, president of International Business Machine, Inc., have employed this formula of their old mentor in the businesses to which they have gone after leaving N.C.R.

Birth of the 'Guaranteed Territory' Plan

The head of a salesman's prospect in the days B.P. (before Patterson) was like a doorknob—anybody could turn it. But Patterson, who understood salesmen better than most manufacturers, contrived to put a lock on each prospect and give the key to one salesman only.

One of Patterson's first moves was to get salesmen—and salesmen for his product were hard to get. Agents were leery of the cash register because it was being called a thief-catcher, and they felt that they'd have two strikes on 'em when they got up to bat.

Furthermore, the straight commission basis on which the cash register was sold didn't bring in prospective salesmen in droves. "The straight commission in those days," write Roy W. Johnson and Russell W. Lynch, "was the sign of lack of confidence in the goods or in the salesman... the badge of the book agent, the lightning rod artist."

But Patterson got his salesmen. He figured out a way. And in the figuring, the guaranteed territory came into being.

He went to some seven or eight men who had been selling cash registers as a sideline, and presented his proposition. That proposition was something wholly without precedent in the history of salesmanship—he offered to assign them territories upon which no other salesman could encroach, and within which no other N.C.R. representative could even "chisel" off a close friend or relative.

So glittering was this proposal to the competition-frazzled salesmen that they overcame their better judgment on the product, and signed up to devote their entire energies to the sale of cash registers. A further reaction was that other salesmen heard about this revolutionary guaranteed territory plan and—straight commission and thief-catcher stigma notwithstanding—gravitated toward the Patterson banner as naturally as they would move toward a bottle of cold beer on a sizzling August day.

Although Patterson used this offer at first as a talking point, the fact that the policy of guaranteed territories has been maintained by N.C.R. throughout the years indicates that he came to think of it as a fundamental and sound business practice.

Of his own volition Patterson might drop a fad or a new idea after he

had tired of it or found it impracticable. He was inflexible, though, on this idea of a "guaranteed territory." He argued with his associates for 15 years about it.

"I want to show everybody," he said at an agent's convention in 1900 (as reported by Johnson and Lynch), "that it is to the interest of the agents to divide up and give guaranteed territory."

"For instance, you cut it into five districts in a city or a state. Here is one that is not occupied. Now I claim that as long as this territory is unoccupied, a man in another territory has no business to get over into this unoccupied territory and sell a register, if he knows that he can sell one."

"You may say that if that territory is lying idle and if a salesman from another territory knows that he can sell a register there, why not let him go over and sell in that territory?"

"I say you have a rule, you have a system, and I claim that it is very wrong to let him go across there, if he is just across the street, because we start out on this supposition: that this man has all he can attend to and watch in his own territory."

"Now, just as long as you allow this territory to remain open for this man to run into, you cannot get an agent to go in there. You want that territory occupied, and just as long as you allow three or four men to go in there from other territories and sell, and just so long as you allow them a commission, so long is that territory going to be vacant."

"But you want to put a great big goose egg on that territory and let everybody know that there is a place that is vacant, and you want an agent for it, and say to this man:

"Now here, you get an agent for that territory for me; if you don't do it, opposition will get in there, and they will sell machines, and that will hurt you all."

"If you allow a man to run into open territory, he would rather spend a week getting an order than to get an order from his own territory in three days."

That Patterson was essentially a salesman, rather than a manufacturer, is shown clearly by one statement he made at the very inception of the N.C.R. Co., when that organization seemed to have practically nothing it needed to make it a strong concern. The statement was this: "If we get the orders, we can easily manufacture the product and make the proper records, but first we must get the orders."

Birth of the Sales Convention

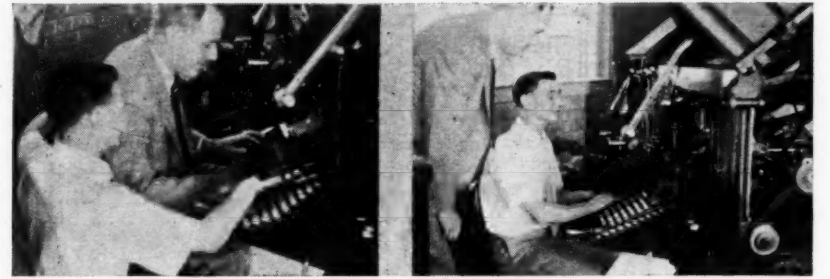
Salesmen who burn the candle at both ends frequently aren't so bright. Patterson felt that if they had time to spare, they should spend it studying the art of salesmanship. And he soon put his finger on the best method of sales education: mutual discussion of their common problems by his salesmen. He believed that improved selling technique would result if his salesmen could exchange ideas and "wrinkles," and he hit upon the sales convention idea as the best means to this end.

Probably the first sales convention on record was that held by Patterson in 1886, when he brought his five principal agents to Dayton, housed them sumptuously in the Phillips hotel, and kept them there—almost under martial law—to talk business and discuss prices for the newly improved registers.

Patterson had a great many questions to ask his agents at that first convention. Particularly he interrogated the men with the best records. He wanted to know how they were selling cash registers, and he wanted his other agents to hear the answers they gave to his pertinent and penetrating questions.

Harry Blood of Chicago was among those who related their sales methods at that first meeting. Patterson discovered that Blood's method involved establishment of personal relation-

Frank West Takes a Lesson



(1) Frank West, Detroit, inventor of the Crosley Shelvador, visits the News' shop and puts his name on a slug. (2) Johnny Belleman, News linotype operator, shows Mr. West how an expert does it.

ships with his prospects before ever mentioning cash registers—which was one of the time-honored tenets of salesmanship for products of high unit value. Patterson thought that idea had whiskers on it.

Joseph H. Crane, a brother-in-law of Patterson, declared that the best way to sell was to get the prospect to leave his place of business and go to a hotel, where he wouldn't be disturbed or distracted by customers, and where he could hear the sales story in peace, comfort, and an atmosphere conducive to thoughtful reception of new ideas. This idea was a winner, for it led Patterson toward the "canned" sales presentation, as we shall tell you later.

The idea of sales conventions was new in the field of specialty selling, and at first, salesmen were inclined to pay little attention to it. Selling up until then had been pretty much of an "every man for himself" game, and a salesman didn't want to let the other fellows in on his methods of making sales.

It was this veil of mystery that Patterson sought to tear down. He wanted to develop a general sales technique with definite standards. As could have been expected, the salesmen rebelled at first. Not only did they resist divulging their pet ideas and personal formulas for overcoming sales resistance and getting a prospect's name on the dotted line, but to them anything resembling a scientific approach to the art of selling was the sissified idea of a crackpot.

They could tell you how they made sales: It was simply the effect of their own dynamic personalities upon the wary prospect!

But President Patterson had said there would be sales conventions, and so there were sales conventions. At first that was the spirit with which they were received. But Patterson was right. These conventions immediately became melting pots for ideas from which emerged some of N.C.R.'s shrewdest sales strategies. Salesmen who had been loathe to part with "pet ideas" became so inspired by revelations of other men that they were induced to contribute their own shares toward the development of a general sales technique.

Personal pride entered a little into this, as Patterson had probably foreseen. No good salesman was going to sit there calmly while some other fellow got all the attention and limelight for reciting ideas that he felt weren't half so useful as those he had worked out in actual practice.

From this first tiny budding in '86 there finally grew the enormous meetings, in later years, of the best talent in the entire Patterson organization—the Hundred Point conventions—where higher-ranking salesmen enjoyed many forms of recreation, and traded sales punches like amateur boxers swapping blows in a battle royal.

In the highly developed state, which these meetings eventually attained, the conventions became occasions for recognizing and lauding the successful labors of good salesmen. Mr. Patterson was indeed liberal in bestowing rewards for a job well done, but rarely did he make a medal presentation without tacking on his invariable: "That's fine. Now do it better."

It is not difficult—in fact, it's fun—

to picture Patterson presiding over a sales convention. He was fundamentally, forever and always, the showman. At each convention he had at his disposal the equipment and paraphernalia of a small theater. He dramatized to a fare-thee-well the instructions he thought most a *propos* for his selling force. And of course he had always at hand the cartoonist's crayon and huge pad of paper on which he sketched, diagrammed, and outlined his ideas.

Here at conventions his famous and much-imitated "playlets" were staged to illustrate methods of salesmanship. One (presented in 1916)—embracing a dramatization of a model cash register sale from initial approach to final installation—was considered so valuable an aid that it was later made into a motion picture and widely used among N.C.R. employees. (This was the Birth of Sales Education Movies—another institution in modern specialty salesmanship. But we'll let you off this time with a sentence, rather than a chapter).

Every convention was carefully planned for weeks in advance, and cogently calculated to produce the desired emotional and mental effects. Pageantry, lights, color, and musical scores—everything fit into the picture. Patterson believed that "the dramatic points do not come by accident. If everyman trying to put over an idea to one man or to 10,000 would study his setting, he could achieve interest-holding methods."

Perhaps no other of Patterson's sales institutions was so highly developed, or took so much of his time, as did his sales conventions. He called a convention on every possible occasion, and they were live and memorable gatherings, as any old N.C.R. man will tell you. He even had a building erected to house the meetings; and while his salesmen were in Dayton, they lived in the best hotels, were showered with gifts and prizes from the lavish hand of the president, and were made to feel (decades antecedent to Huey Long) Every Man a King.

The conventions carried out four of Patterson's strongest convictions: that valuable ideas and suggestions would result from mass discussion meetings, that men are more easily taught in a group than separately, that personal training is much better than that attempted by mail, and that such meetings offered an ideal opportunity for demonstrating points to salesmen *visually*. This last point was a pet. He felt dead sure that his men learned better by eye than by ear.

In addition to the salesmen's conventions, there were conventions for factory employees, for office forces, and, by golly, for wives of salesmen!

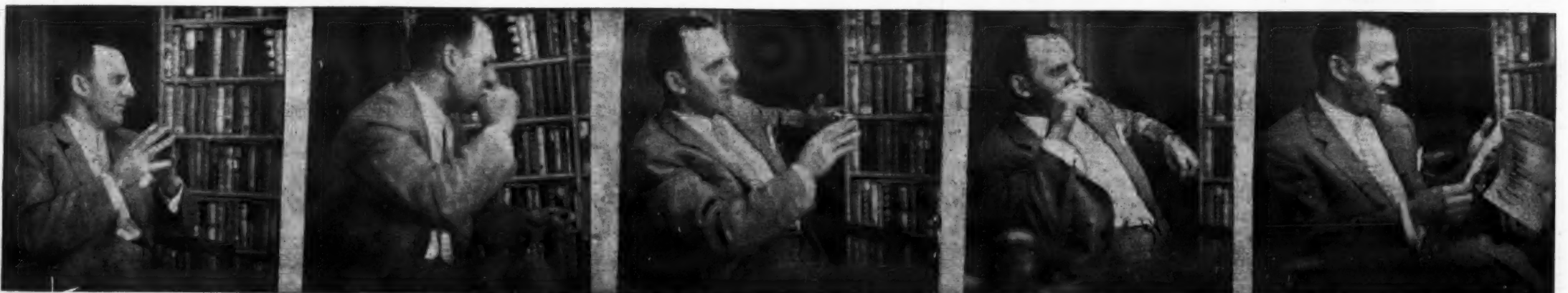
An audience, to this Barnum of Salesmanship, was as fascinating a subject for his extraordinary powers as ever he found. He played it like a theater organist at the Mighty Wurlitzer—*planissimo*, *fortissimo*, *crescendo*—arousing whatever mass moods he felt were indicated.

No Jessel, Jolson, or Richman was ever more adept at sensing audience reaction, or changing the color of its moods.

Attending an N.C.R. convention must have been fun.

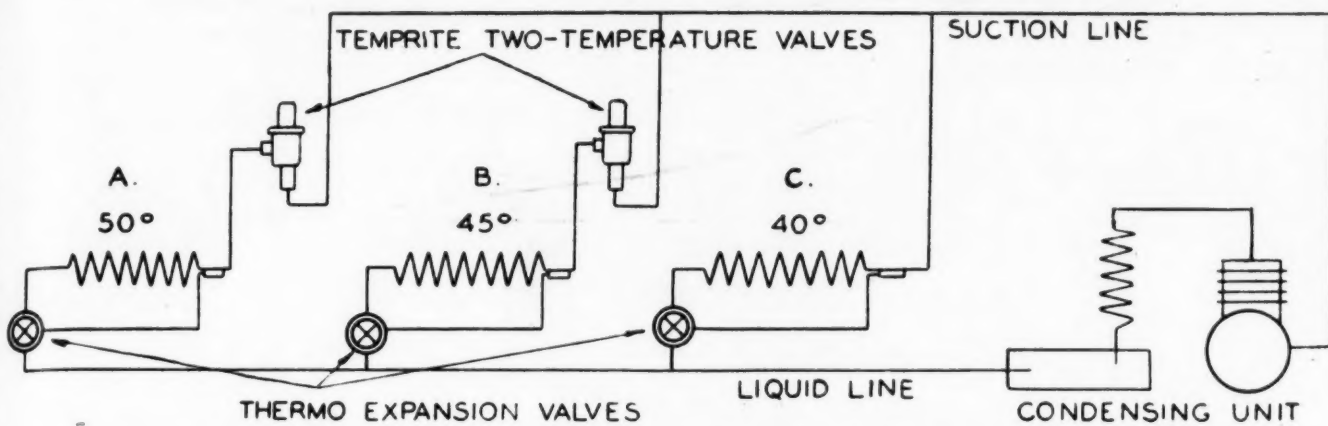
(To Be Continued in the Next Issue)

Colyer Explains the 'Tricks of the Trade' in Jobbing Refrigerator Parts and Supplies



J. D. Colyer, assistant secretary-treasurer of Wolverine Tube Co., discusses parts jobbing with the publisher. (1) "It's an important business. The good jobber must have an adequate stock and give real service." (2) "He must be prepared to make quick deliveries." (3) "He should display his stock, so buyers can see what they're getting." (4) "He ought to know refrigeration, and be able to advise service men on their problems." (5) "If he does a good job of taking care of his trade he can get a fair price for his goods and need not worry about 'mail order competition.'"

Application of Temprite 2-Temperature Valves



Drawing representing an expansion system with three cooling units. (A) is a display case operating at 50° F., (B) a service refrigerator operating at 45° F., and (C) a storage box in which 40° F. is to be maintained. A pressure control is used on the compressor and is set to maintain the proper temperature in coil (C) while units (A) and (B) are each equipped with two-temperature valves to provide separate regulation for them.

Temprite Markets Two-Temperature Throttling Valve

DETROIT—Temprite's two-temperature suction pressure control valve, which has been in standard use on Temprite beverage coolers, is now available for suction line pressure regulations in all types of general commercial refrigeration applications. Sales Manager John Wyllie, Jr., of Temprite Products Corp. reported last week.

The same valve can be used with systems in which Freon, methyl chloride, or sulphur dioxide is the refrigerant.

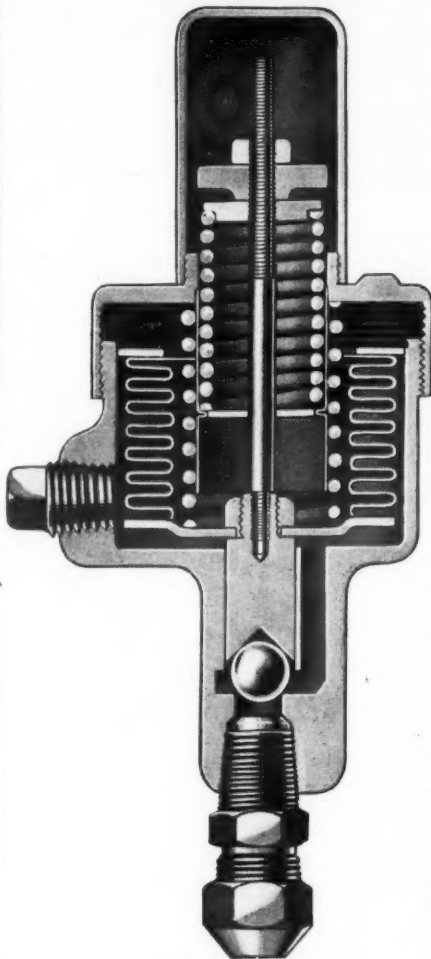
Listed by Mr. Wyllie as the principal features of the valve are easy installation and adjustment, large gas capacity, close temperature control, extreme sensitivity, and wide range of adjustment.

Usual application of this valve is to the multiple system, but its control is so sensitive that it is frequently used on single installations where a more constant and closer regulation is required than can be furnished by the condensing unit control switch. It may be used with either flooded or thermostatic expansion valve systems, or with a combination of the two types.

Temprite's valve is of the throttling type which means that it accomplishes temperature control by regulating the amount of evaporation from the cooling unit to which it is connected, rather than by suddenly cutting it off entirely. As the cooling unit approaches its required low temperature, the valve begins to close, which reduces the amount of refrigeration and results in all of the cooling units in the system reaching their cut-out points at nearly the same time.

This procedure is said to maintain a better balance in the system and eliminates the difficulties which are encountered when a large compressor is forced to operate on only one or two small cooling units with all of the others entirely cut off. The valve will close tightly when its cut-out

New Valve's 'Insides'



Inlet is designated by the nut on the left-hand side of the valve at the middle, the outlet at the bottom, adjustment nut at top.

point is reached and will remain closed so long as the pressure within the cooling unit is below the cut-out point.

Closing point on the standard valve is adjustable between 15 in. of vacuum and 26 lbs. pressure.

The valve is equipped with two adjustments, a knurled nut which is for fine adjustments and an adjusting cap which is for coarse adjustments.

19 Crosley Dealers in Pennsylvania Named

CINCINNATI—Nineteen new Crosley dealers were appointed in western Pennsylvania last week. The new retailers of Sheldors are as follows:

Monarch Electric, York Supply, Arnold & Co., Camera Radio Shop, Goldneson's Furniture Co., all of Pittsburgh; F. C. Wampler & Son, Inc., McKeesport; J. Hirschberg, McKeesport and Braddock; Ruben Furniture Co., Homestead; Valley Radio & Electric Shop, Turtle Creek.

Murray Furniture Co., Sharpsburgh; Hegner Hardware Co., Sewickly; Jaffe Furniture, Carnegie; Warren Service, Warrendale; Johnston-Beyer Hardware, Rural Valley; Mateer's Furniture Store, Kitanning; George Hotelling, Knox; Clearfield Supply, Clymer; and Sutter Hardware Co., Homer City.

N. T. Sellman Elected Vice President of Utility

NEW YORK CITY—N. T. Sellman, formerly director of sales and utilization for the Consolidated Gas Co. here, has been appointed assistant vice president in charge of sales and customers' service.

While Mr. Sellman was supervisor of the sales department of this company, approximately 200,000 gas refrigerator installations were made on its lines.

For work done in connection with gas refrigeration, Mr. Sellman received the first Munroe Award.

Georgia Power Uses 3 More Sales Coaches

ATLANTA—Three electric appliance coaches under the sponsorship of the Georgia Power Co. started a tour during the last week of July of the retail towns in which there are no stores maintained by the utility. Coaches are under the direction of rural merchandise salesmen in whose territories they are to be operated and are being used by them on a rotating monthly schedule.

The merchandise display coaches are small traveling stores of the trailer type. Inasmuch as these coaches are not designed for demonstration purposes, they are smaller than the home service division's electric kitchen. Each coach is equipped with two refrigerators, two ranges, a water heater, a water pump, a washer, an ironer, and an assortment of small appliances.

Rural merchandise salesmen and their divisions are as follows:

R. S. McGarrity, Athens; A. R. Ergle, Augusta; W. O. Patterson, Columbus; A. M. Pickard, Columbus; N. B. Mathis, Macon; Bruce Godwin, Macon; and F. A. Hood, Rome.

Department Stores Urged To Cooperate in G-E Building Program

CLEVELAND—Department stores are urged to cooperate in the plan to build one new house for each 100,000 of population throughout the country by Sept. 1, by Ralph C. Cameron, manager of the department store division of General Electric's specialty appliance department.

"We believe this activity will serve as a spur to new building, and that it also will help to focus attention on home furnishings," Cameron says.

"General plan of the General Electric Co. is to offer selected builders new ideas, prize-winning drawings, substantial discounts and terms on electric equipment for the homes, and national advertising and support—all in consideration of these builders' construction of demonstration style homes. The company is assured of the cooperation of the Federal Housing Administration and of numerous builders, publishers, and banks."

DuPont Products Shown at Eastern States Exposition

SPRINGFIELD, Mass.—Twenty-one manufacturing divisions of the E. I. du Pont de Nemours Co., Inc., will exhibit their products and the processes by which they are produced at the Eastern States Exposition here, Sept. 15 to 21, inclusive.

Designated as "The March of Chemistry," the exhibit will be under the direction of William R. Hart and R. A. Applegate, director and assistant director of du Pont advertising.

The exhibit will be of an educational nature and will attempt to show how chemical products are made, how they are used, and how they serve the ultimate consumer.

Hines Co. Ensconced In New Quarters

BALTIMORE—The Hines Co., local distributor for General Electric refrigerators and other appliances, has moved to its new quarters at 505 N. Howard St. Main floor of this three-story building is devoted to sales and showrooms. An all-electric G-E kitchen is included in the new appointments.

New Dealer Has Large Norge Display

SEATTLE—The recently established Norge Conditionaire Co. of this city is featuring a complete line of Norge home equipment. A display of refrigeration, heating, and air-conditioning equipment is on exhibition.

Small but Well-Trained Sales Force Gets Results for B. O. R. Radio Co.

READING, Pa.—Good stuff, says the old adage, often comes in small packages. And Barney Ollivierre, manager of B. O. R. Radio Co. here, believes that the same thing applies to a specialty selling staff.

B. O. R. Radio's staff of salesmen, limited to five men, turns in a volume which would do credit to a group of from 10 to 15 men, says Mr. Ollivierre. Salesmen make more, and so does the company—because salesman turnover is smaller, training expense is smaller, and the problem of the indifferent, inefficient salesman is done away with.

This small sales force gets results. Recently, Mr. Ollivierre said, he compared his salesmen's earnings with those of a larger operator, whose top ranking men averaged \$38 a week in commissions.

"In our organization, we have men whose average income is at least 50 per cent larger than that—married men, who pay income taxes on their earnings as appliance salesmen," he said.

Selling efficiency? Mr. Ollivierre has an answer for that, too.

"We have one man who has, I believe, established a record that is unequalled in selling electric refrigeration—not in dollar volume, but in percentage of customers sold."

"During the last year this man has sold 95 per cent of his prospects for electric refrigerators."

High pressure methods? No.

"This man's results are due to a knowledge of electric refrigeration such as few salesmen have, or would take the trouble to acquire. He has made a study of every type of refrigerator sold in this territory—and he can explain the mechanical features of all competitive lines as well as of his own."

"His attention to every detail, however slight, and his ability to answer every question, does more than any other one thing to build the prospect's confidence in him, and make sales."

B. O. R. Radio's salesmen do no house-to-house canvassing. Large use of newspaper advertising space increases floor traffic, and users are contacted several times yearly to furnish names of prospective buyers among their friends and acquaintances.

Every four months, the company mails out 2,000 prospect cards to its customer-owners, accompanied by a letter asking owners to list the names of friends who might be prospects for refrigerators or other appliances, and offering them some small gift (such as an electric iron, table lamp, or hair dryer) if one of the persons they suggest buys a major appliance.

About 8 per cent of the cards are returned, Mr. Ollivierre estimates, averaging about five names to the card—a total of 160 cards, and 800 prospects, to the mailing.

Of this total, approximately 10 per

cent are sold within a short time, while about 50 per cent become customers eventually.

Trade-ins are handled in a standardized manner by all dealers in the city—\$5 allowance being made for an ice refrigerator on the purchase of a lacquer-finished refrigerator, and \$10 on an all-porcelain unit. There is no resale problem, the ice boxes being taken directly to the auction house, there to be sold to the highest bidder.

Careful checking on the prospect's credit standing, and arrangement of payments on the basis of his ability to pay, has reduced repossessions to the point where they are practically negligible, Mr. Ollivierre said. Monthly earnings, credit standing, etc., are checked before any sales agreement is reached. Knowing the prospect's financial standing, the salesman understands better how to talk price and terms.

Salaried Salesmen Boost Refrigerator Sales of Auto Parts Firm

CEDAR RAPIDS, Iowa—Salaried salesmen have boosted the sales volume for the Standard Tire Co., local automobile accessories dealer, who has sold electric refrigerators for many years. This company employed 16 people two years ago—today it is employing 27.

Standard Tire Co. has sold nearly four carloads of Crosley refrigerators this season. It maintains a 24-hour service. Policy of the company is to see that no customer is without refrigeration or radio reception over night.

E. H. Owen, owner of Standard Tire Co., states: "Four men are working on our sales force at the present time, and it has been our policy to have salaried men rather than commission men, as we can hire a better type of salesman and get the representation that we want in our community."

"Due to our complete one-stop service station in connection with our home appliance department and through owners of Crosleys, we are able to secure enough prospects so that our salesmen are kept busy calling on definite leads."

The company uses local newspapers, and the local broadcasting station, as advertising media.

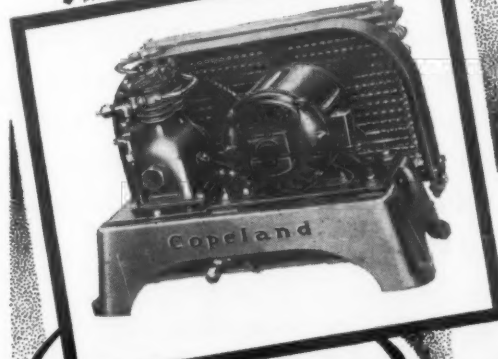
Furniture Co. Opens G-E Appliance Dept.

NASHVILLE, Tenn.—The Reed Sharp Furniture Co., of this city has just opened a complete electrical appliance department in which General Electric refrigerators, ranges, and home laundry equipment will be sold.

R. B. Scarborough is manager of the department.

PERFORMANCE

That Sells JOB after JOB



30
COMMERCIAL
Models
FIT EVERY INSTALLATION

COPELAND dealers and distributors are in a most advantageous position to close commercial refrigeration business against any competition.

With 30 commercial models, Copeland has a unit to fit every kind of commercial application.

In point by point comparison, Copeland's superior design and quality construction features, assure the highest efficiency, the lowest operating cost, and the longest expectancy of trouble-free service.

Copeland has the experience, the background, the ability and the product because—

COPELAND HAS SPECIALIZED IN ELECTRIC REFRIGERATION EXCLUSIVELY FOR 18 YEARS.

The easiest way to close more commercial refrigeration business is to sell Copeland.

Just a few territories open. Write now.

COPELAND REFRIGERATION CORPORATION

Manufacturers of a Complete Line of Household and Commercial Refrigeration
Holden Ave. at Lincoln ... DETROIT, MICH.

Copeland
DEPENDABLE Electric REFRIGERATION

a
good
refrigerant...



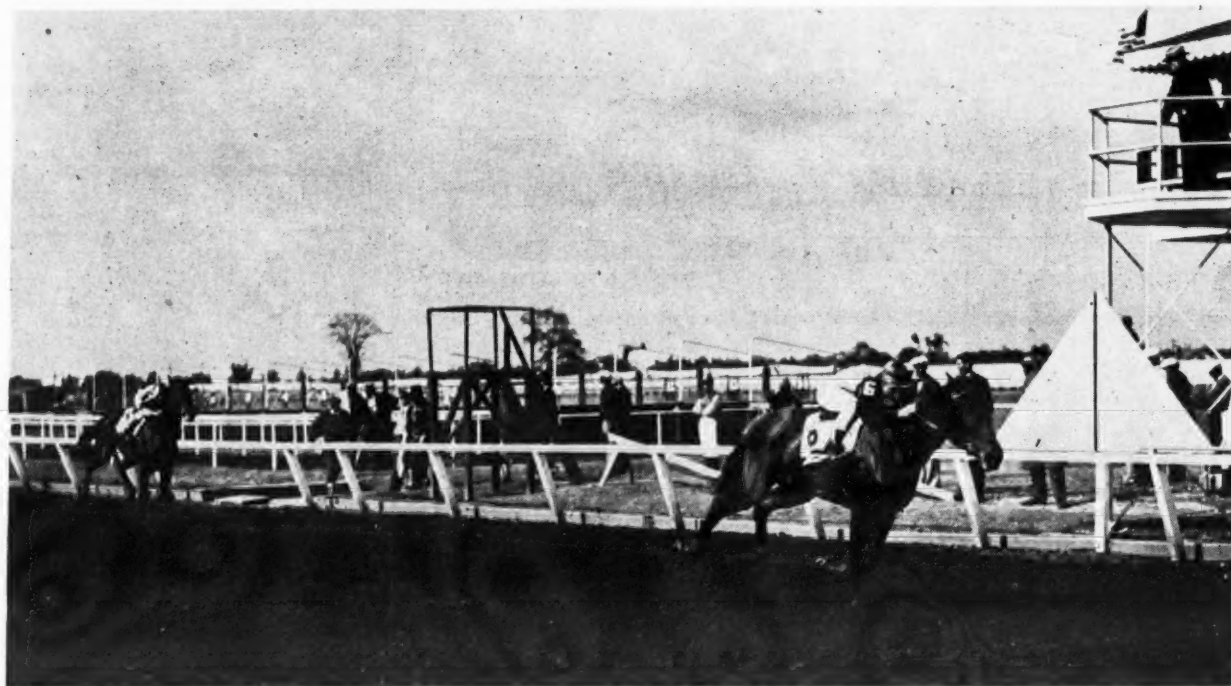
Artic

REG. U. S. PAT. OFF.
(DU PONT METHYL CHLORIDE)

Low in Moisture
Low in Acidity
99.5% Pure

Write for technical
book, Service Manual,
Service News

THE
R. & H. CHEMICALS DEPARTMENT
E. I. du Pont de Nemours & Co., Inc.
Wilmington, Del.



Three Lengths Ahead

LIKE the races, the refrigeration business is uncertain. The one out in front doesn't always hold the lead. Ever changing, always new, competitive to the limit—any possible advantage taken or overlooked may make all the difference in the final result. And the jockey who knows all the "tricks of the trade" has a long advantage from the start.

The man who wants to hold his place—and get ahead—must grasp the opportunities of each change of method, each new development in product, each new field which is open to him. To do this, he must know the industry—its background, its characteristics, and all its interwoven current trends.

The 1935 Refrigeration and Air Conditioning Market Data Book, supplementing the 1935 Refrigeration and Air Conditioning Directory and Electric Refrigeration News, makes this complete information available for reference at any time. The use of this new volume offers a full length's advantage over the uncertain method of making decisions and plans without a knowledge of all the facts.

On the page opposite, the contents of this 304 page volume are given in detail. The statistical data, charts, and tabulations form a composite picture of the industry as viewed from almost any angle of approach. As such, they are invaluable to the executive who reads the meaning of the figures in terms of past trends

Some of the topics discussed by the editor of Electric Refrigeration News in his informing survey on refrigeration and air conditioning included in the new Market Data Book are:

- Distribution Methods
- Selling Formula
- Sales Training
- Sales Contests
- Advertising Programs
- Multiple Dealerships
- Department Store Sales
- Public Utility Merchandising
- The Rural Market
- The Dairy Industry
- Commercial Refrigeration
- The Commercial Market
- Refrigerated Trucks
- Water Coolers
- Apartment House Sales
- All-Electric Kitchens
- Quick-Frozen Foods
- Gas Refrigeration
- Functions of Air Conditioning
- Humidification
- Price Variations
- Patents
- Oil Burners
- Ice and Ice Boxes
- Companion Merchandise
- Popular Appliances
- Competition Problems
- Special Discounts
- Chiseling

and future possibilities. From the analyses which are presented (including studies of dealer surveys, air conditioning statistics, household, commercial, and industrial refrigeration, companion merchandising, trading areas and potential markets, etc.) the editor of Electric Refrigeration News has condensed and correlated the more important factors into easily readable form. This summary is placed at the front of the volume, as an introduction to the statistical matter, and makes an excellent guide to this more detailed information. At the same time, it will be found quite valuable as outline history of the electric refrigeration and air conditioning industries. In the back of the book is a record of important events of the industry during 1934, as reported in the weekly issues of the News.

The Market Data Book, the Directory, and Electric Refrigeration News offer three length's advantage to those who want to meet competition with the fullest possible knowledge of their industry.

BUSINESS NEWS PUBLISHING CO., 5229 Cass Ave., Detroit, Mich.

(Order blank for the Market Data Book, the Directory, and Electric Refrigeration News on page opposite.)

STATISTICS

159,127 Household Refrigerators Are Sold During June, 1935 by 14 Manufacturers

The following 14 member companies of the Refrigeration Division of the National Electrical Manufacturers Association (Nema) reported household refrigerator sales and inventories for June, 1935: Apex Elec. & Mfg. Co., Crosley Radio Corp., Fridgidaire Corp., General Electric Co., Gibson Electric Refrigerator Corp., Kelvinator Corp., Leonard Refrigeration Co., Norge Corp., Servel, Inc., Stewart-Warner Corp., Sunbeam Electric Mfg. Co., Uniflow Mfg. Co., Universal Cooler Corp., and Westinghouse Electric & Mfg. Co. Member companies not reporting included: Jomoco, Inc., Merchant & Evans Co., and Sparks-Withington Co. The sales of the reporting companies do, however, include units manufactured for the following concerns: Major Appliance Corp., Montgomery Ward & Co., Potter Refrigerator Corp., Sears, Roebuck & Co., and Truscon Steel Co.

SALES FOR JUNE, 1935					
Domestic		Canadian		Other Foreign	
Lacquer (Exterior) Cabinets Complete	Quantity	Value	Quantity	Value	Quantity
1. Chest	3,642	\$ 180,413	130	\$ 6,512	168
2. Less than 3.00 cu. ft.	80	4,236	11	11	555
3. 3 to 3.99 cu. ft.	7,786	444,268	2	113	1,146
4. 4 to 4.99 cu. ft.	36,462	2,355,052	1,301	91,102	3,905
5. 5 to 5.99 cu. ft.	37,387	2,887,706	503	40,259	1,281
6. 6 to 6.99 cu. ft.	20,586	1,853,131	141	13,111	1,158
7. 7 to 7.99 cu. ft.	9,000	929,425	246	27,872	408
8. 8 to 9.99 cu. ft.	1,683	190,681	3	833	51
9. 10 to 12.99 cu. ft.	58	10,930	1	222	.....
10. 13 cu. ft. and up	.....	.....	.....	.....	.....
11. Total Lacquer	116,684	8,855,391	2,320	178,543	8,162
Porcelain (Exterior) Cabinets Complete					
12. Up to 4.99 cu. ft.	2,342	183,197	69	6,693	33
13. 5 to 5.99 cu. ft.	4,118	359,272	24*	1,992	196
14. 6 to 6.99 cu. ft.	3,499	357,132	7	967	122
15. 7 to 7.99 cu. ft.	3,356	410,514	0	567	162
16. 8 to 9.99 cu. ft.	1,273	189,362	1	116	61
17. 10 to 12.99 cu. ft.	448	80,031	3	565	51
18. 13 cu. ft. and up	293	69,681	3	833	51
19. Total Porcelain	15,329	1,649,189	59	7,749	676
20. Total Lines 11 and 19	132,013	10,504,580	2,379	186,292	8,838
21. Separate Systems	.....	.....	.....	.....	.....
1/4 Hp. or Less	14,598	589,864	.....	.....	829
22. Separate Household Evaporators	337	6,589	21	314	112
23. Total Lines 20, 21, 22	146,948	.....	2,400	.....	9,779
24. Condensing Units	.....	.....	.....	.....	.....
1/4 Hp. or Less	748	36,120	26	1,513	292
25. Cabinets—No Systems	605	17,173	1	114	230
26. Total Household	.....	\$11,154,326	.....	\$188,233	.....
*Indicated in report as to be subtracted from totals.					

Exports of Household Refrigerators

March, 1935, Shipments Reported by the Bureau of Foreign and Domestic Commerce, Washington, D. C.

	Electric Household Refrigerators		Electric Commercial Refrigerators Up to 1 Ton		Parts for Electric Refrigerators	
	Number	Value	Number	Value	Number	Value
Austria	50	\$ 3,016	12	\$ 1,135	.....	\$ 2,038
Azores and Madeira Islands	.....	.....	1	523	.....	23
Belgium	309	24,725	253	22,595	.....	15,835
Bulgaria	3	269	.....	.....	.....	.....
Czechoslovakia	1	65	4	882	.....	2,551
Denmark	27	1,672	23	3,185	.....	853
Finland	1,220	81,596	142	14,363	.....	25,959
France	1	60	4	341	.....	12,996
Germany	139	13,672	3	282	.....	228
Gibraltar	.....	.....	.....	.....	.....	534
Greece	11	800	.....	.....	.....	.....
Hungary	47	3,354	79	7,572	.....	58
Irish Free State	124	9,886	146	12,378	.....	11,279
Italy	170	10,166	20	2,097	.....	6,870
Netherlands	243	18,488	74	7,353	.....	5,255
Norway	2	212	.....	.....	.....	90
Poland and Danzig	13	1,197	.....	.....	.....	.....
Portugal	1	122	.....	.....	.....	2,890
Rumania	.....	.....	.....	.....	.....	.....
U. S. S. R. (Russia in Europe and Asia)	2	118	.....	.....	.....	.....
Spain	325	25,749	243	25,211	.....	10,918
Sweden	197	14,343	109	11,972	.....	11,317
Switzerland	54	3,336	1	268	.....	12,213
United Kingdom	1,073	82,239	1,154	78,391	.....	36,088
Yugoslavia	1	53	3	434	.....	.....
Canada	1,023	47,044	103	16,223	.....	58,173
British Honduras	7	806	.....	.....	.....	11
Costa Rica	4	363	.....	.....	.....	254
Guatemala	12	702	3	832	.....	254
Honduras	2	87	.....	.....	.....	.....
Nicaragua	64	2,937	3	518	.....	683
Panama	3	255	.....	.....	.....	.....
Salvador	431	40,482	10	1,997	.....	3,820
Mexico	13	117	1	287	.....	16
Newfoundland and Labrador	10	604	.....	.....	.....	598
Bermuda	3	306	.....	.....	.....	209
Barbados	3	822	.....	.....	.....	39
Jamaica	7	937	.....	.....	.....	10
Trinidad and Tobago	140	16,028	7	996	.....	5,889
Other British West Indies	26	2,707	2	122	.....	95
Dominican Republic	24	1,623	3	317	.....	7,481
Netherlands West Indies	20	1,875	.....	.....	.....	35
French West Indies	15	1,695	.....	.....	.....	92
Haiti, Republic of	52	2,472	.....	.....	.....	4,098
Argentina	6	782	.....	.....	.....	.....
Bolivia	494	49,488	56	7,839	.....	16,408
Brazil	96	6,140	.....	.....	.....	174
Chile	82	7,360	.....	.....	.....	747
Colombia	22	1,897	.....	.....	.....	3
Ecuador	1	93	.....	.....	.....	27
British Guiana	4	450	.....	.....	.....	47
Surinam	78	8,216	.....	.....	.....	547
Peru	3	407	.....	.....	.....	874
Uruguay	72	7,518	2	891	.....	401
Venezuela	2	259	.....	.....	.....	.....
Aden	357	28,369	34	3,675	.....	7,344
British India	233	25,777	11	954	.....	2,512
British Malaya	23	1,565	.....	.....	.....	89
Ceylon	499	42,533	13	3,627	.....	4,081
China	397	40,312	51	10,277	.....	7,394
Netherlands India	40	2,727	.....	.....	.....	154
French Indo-China	30	3,677	4	2,617	.....	170
Hong Kong	37	5,085	7	1,485	.....	10,740
Japan	380	29,054	123	13,741	.....	12,819
Palestine	110	12,653	8	1,019	.....	2,422
Philippine Islands	13	742	.....	.....	.....	.....
Siam	38	1,564	10	1,249	.....	1,925
Syria	105	7,207	40	5,239	.....	170
Turkey	1	131	.....	.....	.....	.....
Other Asia	291	11,636	5	654	.....	2,479
Australia	4	260	.....	.....	.....	317
French Oceania	26	1,652	1	500	.....	1,316
New Zealand	1	100	.....	.....	.....	191
Belgian Congo	23	2,652	.....	.....	.....	346
British East Africa	1,668	67,675	19	2,023	.....	10,019
Union of South Africa	14	1,184	.....	.....	.....	372
Gold Coast	.....	.....	.....	.....	.....	261
Nigeria	44	3,546	10	813	.....	1,242
Egypt	262	19,418	7	723	.....	4,644
Algeria and Tunisia	13	812	.....	.....	.....	.....
Madagascar	13	1,078	.....	.....	.....	134
Other French Africa	21	1,664	7	1,060	.....	177
Italian Africa	73	5,849	.....	.....	.....	1,717
Morocco	25	2,201	.....	.....	.....	64
Canary Islands	1	25	.....	.....	.....	.....
Other Spanish Africa	.....	.....	.....	.....	.....	.....
Total	11,447	\$821,329	2,814	\$268,916	.....	\$335,149
Hawaii	372	35,329	9	1,013	.....	7,076
Puerto Rico	145	16,688	3	652	.....	729

Westinghouse Ties Publicity Up with Streamlined Train

BOSTON—When New Englanders read about the "Comet," the streamlined flyer which flashed through the countryside at a speed of 190 miles an hour on its trial run, they read also of the streamlined Westinghouse refrigerator, through a novel promotional hook-up that was the plan of J. B. Stevenson, Westinghouse sales promotion manager for the New England district.

This linking of a sales promotional activity to the publicity given the New Haven "Comet" was possible because the train is powered and electrified throughout by Westinghouse. Motors, generators, Diesel engines, lighting, air conditioning, braking, and control, are all Westinghouse installations.

On the day following the Comet's first run from Boston to Providence, 40 Westinghouse dealers in the Boston territory sponsored a double spread advertisement in the Boston daily papers. The same advertisement was later run in the Providence papers.

Illustrated publicity articles and striking window displays in the Boston Edison Co., and R. H. White Co. of this city and the Narragansett Electrical Co., Providence, backed up the Comet promotional copy.

EARNINGS

Stewart-Warner Corp.

Net income of the Stewart-Warner Corp. and subsidiaries for the six months ended June 30, 1935, after all charges including depreciation, federal taxes, and reserve for year-end adjustments, was \$1,020,491, equivalent to 82 cents a share on the 1,246,847 shares of common stock outstanding in the hands of the public, which constitutes the entire capitalization. In the six months to June 30, 1934, net income was \$540,260, or 43 cents a share on the outstanding capital stock.

Sales for the six months ended June 30, 1935, were \$11,005,560, as compared with \$9,240,684 in the first six months of 1934, a gain of 19 per cent.

For the three months ended June 30, 1935, net income after all charges was \$524,428, or 42 cents a share on the capital stock. This compares with net income of \$372,765, or 30 cents a share for the similar period in 1934.

Consolidated balance sheet at June 30, 1935, reveals a working capital ratio of 6.06 to 1, and with cash in excess of \$2,000,000. There are no bank loans.

C. I. T. Corp.

Commercial Investment Trust Corp. in its report to stockholders for the six months ended June 30 shows consolidated net profits available for dividends of \$7,256,517 compared with \$5,100,215 in the first half of 1934.

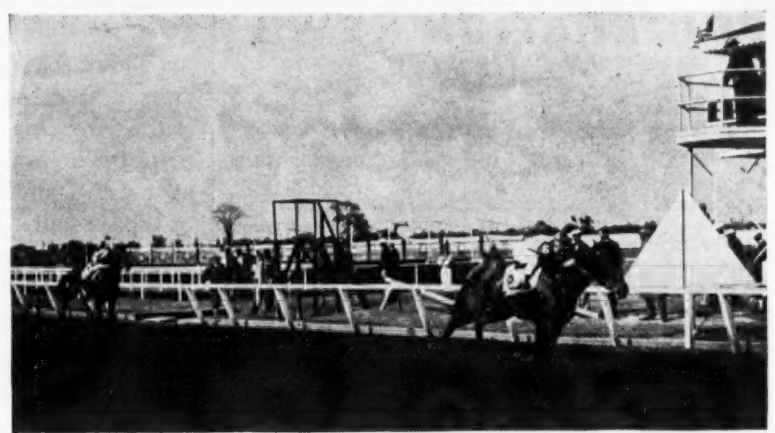
According to the report the volume of receivables acquired totaled \$539,324,877 compared with \$437,789,307 in the corresponding period last year. The results establish a new high record for any six month period.

After dividends on the outstanding serial preference stock, 1929 Series, there remained available for dividends on the common stock \$6,891,188, equivalent to \$2.93 per share on 2,353,292 shares outstanding in the hands of the public at June 30, 1935. This compares with \$4,679,734, equivalent to \$2.52 per share on 1,860,234 shares outstanding in the hands of the public at June 30, 1934, prior to a 25 per cent common stock dividend paid in common stock on October 1 last year.

Henry Ittleson, president, in his report to stockholders, states that "collections have been highly satisfactory, accounts charged off and past due accounts continue to be small, and outstanding receivables are in excellent condition."

During the six months, the corporation followed its usual practice of writing off all determinable and known losses and of setting up reserves considered adequate to protect it against possible future losses and unforeseen contingencies. The net profits reported by the corporation do not include any dividends received on investments in its own securities.

The consolidated balance sheet of the corporation and subsidiaries as of June 30, 1935 shows total assets of \$322,074,796 compared with \$231,554,704 at Dec. 31, 1934 and \$262,900,426 at June 30, 1934. Surplus at June 30, 1935 stood at \$52,510,598 compared with \$48,815,531 on June 30, 1934 before the payment of a 25 per cent stock dividend. Current assets, including cash of \$43,189,068, amounted to \$315,925,347 on June 30, 1935 against current liabilities of \$192,943,629.



Three Lengths Ahead

Like the races, the refrigeration business is uncertain. Add the certainty of complete information with the new 1935 Market Data Book, the Directory, and Electric Refrigeration News.

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ELECTRIC REFRIGERATION NEWS

Registered U. S. Patent Office
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Published Every Week by

BUSINESS NEWS PUBLISHING CO.

5229 Cass Ave., Detroit, Mich. Telephone Columbia 4242.

Subscription Rates—U. S. and Possessions and all countries in the Pan-American Postal Union: \$3.00 per year; 2 years for \$5.00. Canada: \$6.00 per year (due to special tariff). All Other Countries: \$5.00 per year (U. S. Money) (See "Buyers Guide" columns for combination rates with the 1935 REFRIGERATION DIRECTORY AND MARKET DATA BOOK.) Notice: We employ no subscription agents or solicitors. Pay no money to strangers claiming to represent this company. Send orders and remittances direct by mail.

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VOL. 15, No. 14, SERIAL No. 332, JULY 31, 1935

Better Terms

UNTIL recently the Administration of the New Deal has been none too kind to the refrigeration industry. Handicapped in the race for the consumers' dollars by the necessity of paying a 5 per cent "luxury" tax (just why so vital-to-health a service as refrigeration should be deemed a luxury has never been satisfactorily explained) on every household refrigerator manufactured, hamstrung by bureaucratic regulations at odd times, and forced to waste the precious time of executives who frequently must neglect their pressing duties to scratch their heads over ways and means of adjusting their business to the latest academic brainstorm from Washington, this industry for one hasn't been disposed to look charitably upon the Brain Trust's attempts to reconstruct America economically, socially, and politically.

Notwithstanding the industry's outstanding success in maintaining employment and keeping the wheels turning, it has been taxed heavily to support all sorts of random experiments—some of which, like the TVA and EH&FA, have turned around and bitten the hand which was supplying the feed. Refrigeration men have felt that they were buying the toys to go into the pack from which Uncle Santa Claus was distributing with such lavish generosity, but Santa hasn't been coming down any of their own chimneys.

At last, however, it does appear that the refrigeration industry will find itself in a position to reach down into the government sock and retrieve a present for itself. Partly as a result of Washington activities, time payment rates are coming down.

First government alphabet agency to make lower instalment-sale costs possible was the much-maligned EH&FA (Electric Home and Farm Authority). Last year this TVA subsidiary offered to discount—at unusually low rates—dealer paper on all TVA-approved refrigerators sold in the Tennessee Valley. Later this offer was extended to include all models in any manufacturer's line which included a TVA model.

These TVA models themselves caused plenty of trouble. First, the "interim" models (regular 4-cu. ft. boxes with some \$30 knocked off the list price) disrupted and demoralized dealer ranks in the Tennessee Valley and adjacent territories. Next, the TVA "midget" models proved to be hard-to-move "white elephants" which cluttered up warehouses whilst lowering by a considerable margin the figure which the public expected to pay for a refrigerator.

This year, however, the EH&FA has apparently listened to wiser counsel; and instead of attempting to dictate how refrigerators shall be constructed, who shall sell them, and what the price should be, is confining its efforts largely to financing instalment paper and to promotion. Result: Southern public utilities have of their own accord extended these low financing rates to other parts of the South, and refrigeration

sales in the South have been extraordinarily good this year.

Then came the FHA (Federal Housing Administration) with its offer to insure all loans for home modernization made by any private agency by announcing itself prepared to stand 20 per cent of the losses due to default of payment. It took several months for machinery to be set up to handle this business, and for bankers to figure out just how to make the scheme work out in practice.

In recent weeks the system has been worked out to include the private financing—at very low rates—of time payment sales on electric refrigerators. These latter have been adjudged as home modernizers (radios, it should be noted, have not been so classified) and hence eligible to benefit from operation of the plan.

Prior to the amendment of May 28, 1935, to the Modernization Credit Plan, equipment was eligible only if permanently attached to the wiring, water, gas, or sewerage system. The amendment, however (as elucidated in the bulletin issued by the Federal Housing Administration July 15, 1935), provides that equipment not permanently attached (but merely "plugged in") to such systems may be purchased and installed with the proceeds of insured loans. At the moment of writing it is said that Comptroller General McCarl is strenuously objecting to this amendment; but observers close to the picture in Washington feel that Roosevelt is likely to override McCarl's protest.

A vast amount of hitherto idle capital is ready and waiting to be tapped for this most commendable use. The highly restrictive nature of the new securities regulations, the hesitancy of capitalists to risk their money in new ventures in view of uncertainties about what will next emanate from Washington, and the efforts of the Treasury to force interest rates down, have all combined to make a situation in which financial houses are more than anxious to put money in their control to work for a modest return.

What all this means to the refrigeration dealer and salesman should be obvious. The great majority of all refrigerators are sold on time. Lower rates thus mean lower prices. Reduction of the amount of each monthly payment is of paramount significance; for the average prospect is really interested only in "how much down and how much a month." Removal of contingent liability from the dealer by this FHA insurance plan also makes it possible to install refrigerators for no down payment at all.

Salesmen are now armed with the simplest and most attractive payment proposition they have ever had to dangle before the eyes of the prospect. They now have a big advantage over the automobile salesman, the furniture salesman, the life insurance salesman, and all the other competing interests so assiduously cultivating the same market and hammering at the same prospects.

Low interest rates may well prove to be the most important single development of the 1935 refrigeration season.

WHAT OTHERS SAY

The Rejuvenation of Domestic Appliances

ELECTRICAL appliances for the home have passed through a subtle but a profound transition during the depression. Whereas a few years ago they were pre-eminently engineered products, built for efficiency and performance, today they are conspicuously tailored for popularity. The technical perfection is still there; nay, it has been improved. But the dominant spirit in the industry today is to design appliances that will appeal to women and to men and to establish prices and policies that will induce normal families to buy.

There was a time when electrical men took for granted that these appliances could only be sold after slow, expensive campaigns of market education. Now, the basic idea of using electricity as a household servant is pretty well known and broadly accepted as desirable. So the need is for merchandise that will sell easily, and we have it. The competition between manufacturers today is to enrich well-built appliances with those plus values of beauty, convenience, utility, and luxury that attract purchasers—streamlining, doors that open at a touch, and accessories that are novel and smart. Part of all this has come because it has been hard to sell the past few years. Wits have been sharpened. But beyond that appliance marketing is maturing as an art. We have found out what makes them sell, and the selling has barely started.—*Electrical World*.

LETTERS

Master Service Manual

301 W. Texas St., Denison, Tex.
Editor:

I was interested in a series of articles starting in the April 10 issue of ELECTRIC REFRIGERATION NEWS by K. M. Newcum, and am sorry that several of the issues have been sold out.

Please advise me Mr. Newcum's address, in the enclosed stamped envelope. Or, if he has published a book, on the subject discussed in the articles in your magazine, please advise how it may be obtained.

LYNN MILBURN.

Answer: See below.

Some Back Issues Sold Out

Sam S. Glauber, Inc.
515 East 79th St., New York City
Editor:

I am very sorry that you didn't receive the dime which I enclosed as referred to in your letter. I assume the postoffice department may have thought it was another one of the chain letters.

Since you haven't any more copies of the April 17 issue, is it possible to secure a copy of Mr. Newcum's article only.

A. S. PENT.

Answer: See below.

Wants Newcum Articles

Universal Refrigeration Service
211 East 149th St., New York City
Editor:

With reference to Mr. Newcum's articles of April to July 17, I respectfully request that you mail to me all copies for which I will pay upon delivery or any way you may specify.

W. M. BARZELL.

Answer: See below.

An Order from Australia

Barton Vale, Enfield P. O.
Adelaide, South Australia
Editor:

Please find enclosed money order for £3.2.6, as subscription to your "Master Service Manual" now being compiled, the remaining money to be used as subscription to REFRIGERATION NEWS. Should this be insufficient money, kindly advise and forward News as before, and oblige.

W. SHIELS.

Answer to the four letters above and others inquiring about the Newcum service articles and the Master Service Manual:

The Newcum articles have appeared in 15 issues of the News up to the present date (see list on page 12). Our supply of some of the back issues has been sold out. In order to meet this demand we therefore make the following offers to service men who want to get the material without waiting for the Master Service Manual to be published later when the series is completed.

(1) Send \$3.00 for a year's subscription to ELECTRIC REFRIGERATION NEWS to start now (or as far back as we have issues available) and we will send reprints of all previous Newcum articles in pamphlet form (book size but not bound).

(2) Send your advance order for a copy of the Master Service Manual, enclosing \$3.00 to pay for the complete book, when published, and we will send you, free of charge, reprints of all the Newcum articles published in the News up to the present date. These reprints will be in pamphlet form (book size but not bound).

Why Omit Specifications?

Millner's
Lynchburg, Va.
Editor:

We have received Volume 2 of the 1935 REFRIGERATION DIRECTORY AND MARKET DATA and are very much disappointed to find that it does not contain the usual section giving the specifications on all the best known makes.

Of course, this has been given in recent issues of ELECTRIC REFRIGERATION NEWS but it is decidedly more convenient to have it in book form as you have had it before. We wish to go on record as protesting against the policy of leaving it out.

We feel that a great many other subscribers will feel the same way about it.

R. S. TERRY.

Answer: We considered this matter very carefully and decided to omit specifications for a number of good reasons which are based upon the views expressed by a great many subscribers to our publications.

In printing the 1934 edition of the DIRECTORY AND MARKET DATA BOOK, we simply put in one volume all of the material of every kind of description which we thought might prove useful. The result was a very bulky book.

While we had no complaints that anything was omitted from this book, we did have suggestions that the needs of various kinds of subscribers would be better served by breaking

up the material into separate volumes. A study of the material showed that it consisted of two very obviously different kinds of data. First, there was the directory information which is primarily used by buyers. Second, there was the market data and statistical information which is mainly of interest to sales executives.

The specifications did not fit into either one of these groups. Furthermore, the demand for specifications was mainly from dealers and salesmen.

We considered the advisability of publishing the specifications in a separate book, but experience seemed to indicate that subscribers could be best served by making the material available in an issue of ELECTRIC REFRIGERATION NEWS which could be furnished at the nominal price of 10 cents per copy—whereas it would be necessary for us to charge at least \$1.00 for a book containing the same material.

You will recall that we published all household refrigerator specifications in ELECTRIC REFRIGERATION NEWS, March 20, and that all of the data (revised) was again published June 12. You will be interested to know that we sold a total of more than 40,000 copies containing household specifications.

We certainly would have been very much pleased to sell that number of books at \$1.00 per copy, but we doubt whether the trade would have been willing to pay that price.

It Doesn't Sound Practical

Cincinnati Doll Co.
311 East 12th St., Cincinnati
Editor:

A friend of mine, who by the way is gifted with brilliant ideas, dropped a suggestion which urges me to write and ask you to give me data and information on the subject if you can.

The idea is the possibility of so designing a cylinder equipped with an agitator to make ice cream by whipping, to be so designed that the refrigerator motor will furnish the power to turn the agitator.

The intention is for this equipment to be a part of the average household refrigerator.

Is there such a thing already developed, or has anybody thought of a dew-dad of this type.

WM. W. GOODMAN,
Art and Sales Director.

Answer: Easy-Way Co., 432 W. Marquette Rd., Chicago, advertises an ice cream freezer which fits into the deep tray compartment of the cooling unit in a household refrigerator. It has a self-contained electric motor with a flat cord which may be connected to an outlet outside the refrigerator. The gasket prevents cutting the cord when the door is closed. The motor is designed to stall without injury when the ice cream is properly frozen.

It is necessary, of course, for the electric refrigerator to have sufficient freezing capacity to overcome the heat introduced by the electric motor of the ice cream freezer (some units on the market today do not have this excess capacity).

The scheme proposed by your friend would, theoretically, avoid putting heat into the freezing compartment; but the mechanical equipment necessary to connect up the freezer in the insulated portion of the refrigerator with the motor outside would probably be entirely too expensive.

No doubt a unit could be designed and built into a new refrigerator and our guess is that every inventor in the industry has tried to figure out a satisfactory gadget which would not add too much to the cost of the complete refrigerator.

Most Enlightening

78 Lincoln Ave., Carbondale, Pa.
Editor:

I desire to take this opportunity to thank you for your kindly thought in sending me the issues of the News for May 22 and May 29.

Having been a member of the American Society of Refrigerating Engineers for a score of years and besides attending some of the meetings of the Refrigerating Machinery Association, you must know how pleased I was to receive the above mentioned copies of your worthy paper.

The remarks with papers prepared for the recent spring meetings were most enlightening. Your knowledge with general information pertaining to the refrigerating industry commends praise.

I have always been interested in commercial refrigeration and now the progress in air-conditioning lines. The latter is still a luxury, but it may become a real necessity when people have more money, for it does promote health and happiness.

E. M. HOLCOMBE.

"I would like to say that ELECTRIC REFRIGERATION NEWS should be complimented on the published data both on domestic and commercial refrigeration and air conditioning. This is without question of doubt of value to anyone interested on the firing line."—R. Siefert, Morley-Murphy Co., Green Bay, Wis.

AIR CONDITIONING

Texas Hotel Orders More Cooling



When the Baker Ice Machine Co. air conditioned the Kemp hotel in Wichita Falls, Tex., with the Trane suspended-type unit conditioners as shown in this picture, the management declared that more rooms would be conditioned if the original system proved satisfactory. Not much more than a month passed before 8 additional units of this type were ordered.

Kemp Hotel Adds to Conditioning System After Month's Trial

WICHITA FALLS, Tex.—Additional suspended-type unit air conditioners, manufactured by the Trane Co., have been ordered to supplement the original installation put into operation in the Kemp Hotel here a little more than a month ago. The original installation was made by Baker Ice Machine Co., with individual Trane conditioners in each room.

When the contract was let, it was understood that if the job was successful additional rooms would be cooled. Apparently one month's operation of the air-conditioning system was enough to satisfy the proprietors.

Individual Control

The eight additional rooms to be conditioned will be fitted out with the same identical units already in other rooms of the hotel, these units being so designed that each guest has individual control of the amount of cooling in his room.

This is accomplished by means of a 3-way switch controlling the speed of the motor which drives the fans.

By-Pass System

Another feature of the system is the fact that each unit is equipped with a by-pass valve which by-passes the direct expansion refrigerant around the unit when the room is not occupied, to make for economic operation of the system.

Trane light-weight fin coils are employed in the units, the coils being applicable for heating as well as for cooling. The units will be used to heat the rooms in the winter.

Utility Promotion Tells Advantages of Air Conditioning

NEW YORK CITY—A new three-page, illustrated mailing piece describing advantages of air conditioning in offices has recently been issued by the New York Edison Co.

The leaflet says air conditioning steps up office efficiency as follows:

"It frees the air of excess humidity and thus induces comfort.

"It cools the office degrees lower than the street.

"It prevents minds from wandering and assists you and your fellow workers to concentrate on office tasks without exhausting effort.

"It helps you to make rapid, correct decisions.

"It makes everybody good natured and eager to cooperate.

"It saves valuable time consumed by distracted workers trying to forget their bodily discomfort.

"It eliminates distracting street noises because windows and doors remain shut.

"It does away with all arguments about drafts and open windows . . . there are no drafts."

Comfort Cooling Gains Increased Popularity With St. Louisians

ST. LOUIS—Air conditioning is becoming increasingly popular in St. Louis homes, not only because of the health and comfort which it makes possible, but also because of its surprising economy of operation, reports H. W. McLarney, air-conditioning engineer with Union Electric Light & Power Co., local utility.

A room cooler costs no more than a good sized electric refrigerator, Mr. McLarney says, but instead of cooling about 12 cu. ft. of space, it cools and dehumidifies the air in the entire room.

Costs \$25 for Summer

Cost of operating a room cooler in St. Louis will not exceed \$25 for the entire summer, due to the city's present low power rate, and may be as low as \$12.50, depending on the size of the room and its usage, he says.

What St. Louisians think of air conditioning as a health and comfort factor in enabling them to get through the warm weather months may perhaps best be illustrated by the following comments:

"Our cooled room is truly a place of comfort during the hot weather. It is used as a living room during the day, and we are always assured of a good night's rest."

"The cooling system not only assured us of comfort during the unbearably hot days, but we were also sure of refreshing sleep during the hot nights."

"The air-conditioning installation enabled us to spend our evenings in comfort, and gave us many nights of restful sleep."

"This equipment has done everything it was expected to do, and has been a source of great satisfaction to my family and myself."

Effect on General Health

Of air conditioning's effect on general health, and its value in the sick room, users said:

"Throughout the unprecedented hot spell last summer, the air-conditioning installation in our home brought to my sister's sick room the atmosphere of a mountain resort."

"Since sleeping in this air-conditioned room, we are free from summer head colds, and we have not noticed the heat nearly so much in the daytime, due to a good night's rest."

"My wife was able to avoid her usual siege of hay fever, to say nothing of the comfort the rest of us enjoyed in our bedrooms. We consider it paid for itself the first year."

"Since the air conditioning has been installed, it has been so satisfactory it is hard to understand how we got along without it."

"Our cooling installation has proven so satisfactory from the standpoint of health and comfort that we feel it has more than paid for itself."

All G-E Conditioning Dept. Divisions Are Housed in One Plant

BLOOMFIELD, N. J.—Air-conditioning department of General Electric Co., which was moved here July 15, is occupying space at 5 Lawrence Ave., formerly devoted to the manufacture of G-E industrial control devices.

The move included the main sales, advertising, and engineering offices located in the General Electric building in New York City, and design, engineering, and manufacturing activities formerly carried on in Schenectady, Philadelphia, Cleveland, and other eastern cities.

According to departmental officials, the move was made in the belief that uniting all operations under one roof would result in efficient production and promotion. Development of new equipment in particular, say the officials, will be abetted by having research engineers, designers, sales, and advertising staffs at one point to cooperate in all steps concerning such development.

San Antonio Model Home To Have Air Conditioning

SAN ANTONIO, Tex.—The Little Home on Auditorium Plaza, being built by local contractors under sponsorship of the Bexar County Better Housing Committee, will include an air-conditioned bedroom in addition to its other modern features.

Application of this modern method of obtaining summer comfort, it is expected, will prove a feature of outstanding interest to persons who visit the model home after its completion.



HOT WEATHER

Shows Just How Good the Beer Cooler Is

A beer cooler may get along reasonably well in cool weather when the job is comparatively easy. But the real hot day puts the average cooler right on the spot and likewise the dispenser who has to use it.

Hot weather puts an extra load on any refrigerating unit, but in addition it creates a much heavier demand for beer. Unless the cooler is adequate, the inevitable result on a hot day is warm flat beer with too much foam and too little customer appeal.

But the hot days are no obstacle to Temprite Coolers, which operate on the basic principle of instantaneous cooling to a pre-determined temperature. Regardless of what the thermometer may read or how lively business may be, the Temprite is equal to its job. Beer through a Temprite is just cold enough—always palatable and has a rich creamy collar of the correct depth. NONE of the beer is ever wasted.

Write for the complete story

TEMPRITE PRODUCTS CORPORATION

1349 EAST MILWAUKEE AVENUE
DETROIT, MICHIGAN

ORIGINATORS OF INSTANTANEOUS LIQUID COOLING DEVICES

**LARGE PERCENTAGE OF
NEW STORE FIXTURES
served by
UNIVERSAL COOLER
CONDENSING UNITS**



The factory engineered installation has one outstanding characteristic—there is perfect coordination between fixture cooling requirements and the condensing unit. • Universal Cooler Condensing Units are chosen for fine fixtures because they are adaptable, efficient and economical.

UNIVERSAL COOLER CORPORATION

DETROIT, MICHIGAN

BRANTFORD, ONTARIO

MANUFACTURERS OF A COMPLETE LINE OF HOUSEHOLD AND COMMERCIAL REFRIGERATION

AIR CONDITIONING

'Zone Units' & Damper Control Feature Air Conditioning of Famed Dearborn Inn

By Phil B. Redeker

DEARBORN, Mich.—Completely air conditioned throughout with a system which incorporates the latest ideas of Carrier Engineering Corp. for such year-round installations, Henry Ford's Dearborn Inn here is enjoying its greatest summer patronage in years, both in its guest rooms and dining rooms.

"Of our patrons I can say that 99 per cent of them have expressed extreme satisfaction with the operation of the system," states Richard L. Widlund, assistant manager.

From the standpoint of the Dearborn Inn guests, Mr. Widlund says, the outstanding features of the air-conditioning installation are that it provides even, comfortable temperatures at all times without drafts, and is quiet in operation.

'Zoning' System Worked Out

From an engineering standpoint, the important new features of the installation is the system of "zoning" which has been worked out to cut down capacity and to provide correct temperatures for all parts of the building, and the controls, which cut manual care of the installation to a minimum.

Briefly stated, the air-conditioning system is comprised of an air washer which sends clean, cooled, and dehumidified air in the summer, and clean and humidified air in the winter, to the 12 zone units.

Air Mixed in Zone Units

These zone units mix the air from the central system with recirculated air from the rooms (in the summer) and supply it to the guest rooms, lobby, coffee shop, dining room, barber shop, etc., according to which sections of the hotel they handle. In the winter there is no mixing, a constant flow of humidified air with a proper amount of fresh air introduced being supplied to all rooms constantly.

The zone units then, are nothing more than blower units with a damper arrangement to provide a proper mixture of the cooled and the recirculated air.

Temperature Control

Control of temperatures is accomplished by means of air-pressure operated dampers in the various zone units. Actuated by thermostats, the damper at the point where the main supply duct meets the zone unit opens when cooling is called for, and closes while at the same time opening the damper on the recirculated air return zone ducts when the desired temperatures have been reached.

Zoning of the building for purposes of air conditioning was very carefully

worked out, with particular attention being paid to a layout whereby all sections of a particular zone would have, at one time, the same estimated heat gain from such sources as the sun, etc.

In guest room zones, the thermostat control bulb is placed on the wall in one room only, the room selected being the most typical of the average atmospheric conditions found in the entire zone. In the dining room and other public rooms, the control bulb is placed in the recirculated air duct.

Static Pressure Regulated

A great enough static pressure is maintained in the two main supply ducts carrying the cooled, dehumidified and ventilating air to supply as many zones at one time as is necessary.

As the blower, taking air from the washer and supplying it through the main supply ducts, is run all the time at a constant speed, there are static pressure-regulating dampers in these ducts to prevent too great a pressure being built up.

All the zone controls operate through Taylor recording thermostats on a central panel board located adjacent to the central conditioning apparatus in the basement. With these recording instruments the hotel engineering staff can check instantly a temperature rise or drop in any part of the hotel.

Delivered from 'Blue Ribbon' Outlets

Conditioned air is discharged into the guest rooms and most of the public rooms by means of Carrier "Blue Ribbon" high-speed slotted diffusion outlets.

In the guest rooms, these diffusers are located in a false ceiling over the closet which, similar to standard hotel room design, are at the front of the room. The air is thus discharged over the room towards the window.

The slots in the diffuser have been so arranged that they can be opened and shut in various combinations (by a device similar to that used in lowering or opening a hotel transom) so that the occupant of the room can "cut down" on the cooling if he so desires.

Exhausted into Corridor

Air in the guest rooms goes out through the transom or leaks out the door to the corridor. There are gridded openings to two kinds of return ducts in the corridors: one recirculated air duct leading to the zone unit, and the other one leading back to the main conditioning chamber where the air is cleaned, cooled, and dehumidified.

No return registers are to be found in the coffee shop, dining room, or lavatories, eliminating the possibility of a transfer of odor from these particular places. In each of these three places the air is exhausted to the outside.

Coffee Shop Distribution

In two places it was impossible to use the "Blue Ribbon" outlets in the walls. In the coffee shop, the outlets are in the ceiling, and direct the air flow horizontally in a blanket over the patrons.

A more difficult problem was encountered in the lobby, due to its size and construction. Engineers in charge of the installation finally took advantage of the "terraced design" of the huge chandeliers that grace the lobby, opening up the "terraces" to provide outlets through which the air is discharged. But even then the concrete construction of the floor above made it necessary for them to

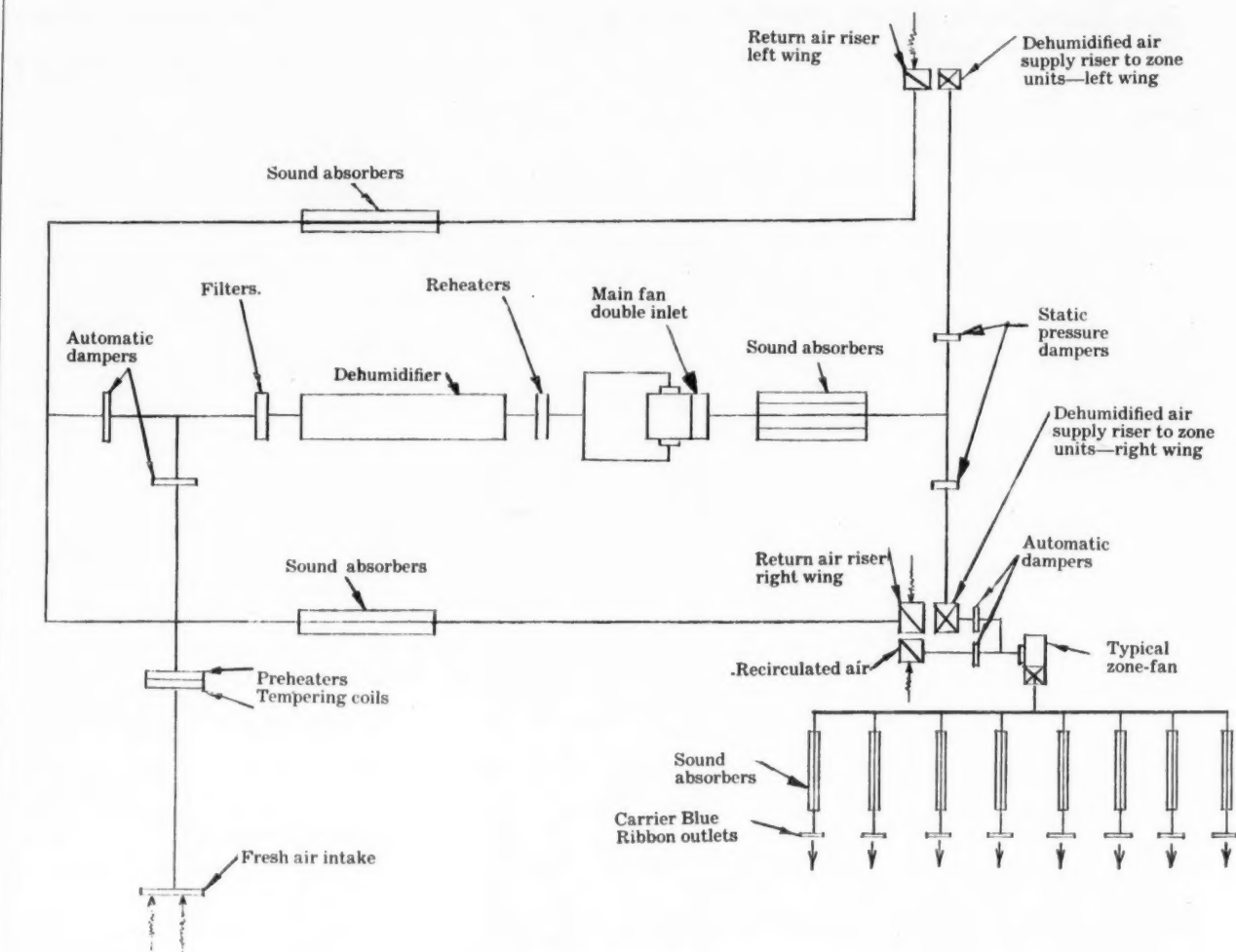
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Arrangement of the various elements that make up the air-conditioning installation at Dearborn Inn is shown in this drawing. At the lower right is illustrated the arrangement for a typical "zone."

run the supply duct up into the attic and drop it down again to take advantage of more than one chandelier.

Extreme quietness of operation is obtained by lining all supply ducts with a seaweed material known as "Cabot's Quilt," which filters out noise. This particular sound absorber is also impervious to moisture. Furthering quietness of operation are Celotex strips used on the return air registers to "straighten out" the air flow as it is pulled into the zone units by fans.

Method of Cooling Water

To cool the water used in the air washer a Carrier centrifugal compressor powered by a 250-hp. motor and with a rated capacity of 250 tons of refrigeration has been installed. Carrene No. 2 is the refrigerant used.

To cut down the condensing water cost for this huge machine a spray pond has been constructed in the back of the hotel, amid the shrubbery which forms a part of the landscaping. Water from the condenser is piped outside and sprayed into the pond, a pump sucking it back to the machine, and supplying condensing water at the rate of 750 g.p.m.

Water-Cooling Tank

Water used in the air washer to condition the air is cooled in a Carrier-designed water-cooling tank which is constructed as part of the centrifugal machine, and in which the refrigerant is sprayed over the water tubes under pressure to speed up evaporation and cooling. Water is cooled to 45° F. and supplied to the air washer at the rate of 600 g.p.m.

This water cools air in the main conditioning chamber to 52° F., at which temperature it is supplied to the zones through the two main supply ducts.

The engineer in charge regulates the speed and operation of the compressor by checking the temperature of the water as it returns to the cooler. According to the hotel's chief engineer, there is a time lag of about an hour before a change of any consequence in the outside temperature is felt.

Return Air Mixed with Fresh Air

In the summer the return air from the corridors and lobby is mixed with the outside ventilation air in the plenum chamber, and is then carried through the filter and the two banks of air washer sprays (equipped with eliminator plates to keep moisture from being carried through) to the zone units by a constant-speed fan with a rating of 35,000 c.f.m.

For winter operation there is a tempering coil and a pre-heater in the fresh air intake, and a re-heater coil beyond the two banks of sprays. Between the last bank of sprays and the re-heater control is a dew point control, which controls the operation of all the heating elements in the main conditioning system, so that the air being recirculated constantly throughout the building is at a definite wet-bulb temperature. Actual job of heating the building is done by steam radiation units in the various rooms.

Cards are posted in each guest room telling about the air-conditioning system, and explaining that best results can be obtained by keeping the windows closed, Mr. Widlund states.

If the guest feels that it is too cool, he can call a bellboy who will close off part of the discharge outlet.

There has been only one real complaint made by a guest about the system, declares the assistant manager. Two elderly ladies felt that they took cold because of the air conditioning.

"But at the same time a guest in the same zone registered a complaint that it wasn't cool enough!" relates Mr. Widlund.

Dearborn Inn has done considerable advertising featuring its air-conditioning system. Inquiries piled up so fast concerning weekly rates for the summer that the management felt compelled to up its weekly rate, in order to have any rooms left for transient guests. Even with the increased rates, the number of "resident" guests has shown a notable increase.

Rates Increased on Rooms

Rates for transient guests have been increased 50 cents for a single room and a dollar for a double room.

Most favorable comment on the system, says Mr. Widlund, comes from traveling business men, and is usually in the form of "best night's sleep I've had this summer."

Increased revenue from the dining room and coffee shop operations has also been recorded. Coffee shop receipts for July are up \$2,000 over last year, according to Mr. Widlund. The average amount of the check has exhibited a marked increase.

Frigidaire Retail Store in Baltimore Cooled

BALTIMORE—Recent installation of air conditioning is that put into the local Frigidaire retail store. Now customers may purchase food-cooling machines in the midst of air-cooled atmosphere.

Director of Mortuary Says Cooling System Has Boosted Clientele

HOT SPRINGS, Ark.—To provide a personal, physical comfort offering relaxation to over-wrought nerves, C. L. Brenner, owner-manager of the Gross Mortuary here, installed York air-conditioning equipment when he recently modernized his establishment, founded 60 years ago.

The mortuary is conditioned by means of two York 5-hp. Freon condensing units. These, together with a ceiling-type conditioner and a system of concealed air ducts keep the mortuary at an even temperature, and automatically regulate humidity.

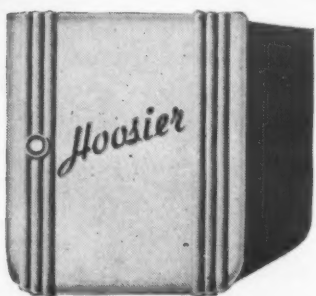
Three floor-type York air conditioners were also installed to condition air in the family room and the lobby. This system is in operation about five months out of the year. Last year showed an average monthly operating cost of \$35.61 for power and \$21.00 for water.

"Air conditioning," said Mr. Brenner, "is one of the best investments any funeral director can make, because it enables him to sell personal comfort to his customers. Our system was installed at a cost of approximately \$4,000 and we can trace business to people who have come to us because we have air conditioning."

Mr. Brenner claims that his clients recommend his establishment to their friends when they have need of a funeral director's services.

Mr. Brenner points out another, more tangible advantage of air conditioning in a mortuary. Odors from the quantities of flowers received are sometimes heavy and oppressive, especially during the hot, humid weather of midsummer, he says. With air-conditioning equipment, fresh, cool air is circulated and odors cleared away.

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Commonwealth Edison Provides Centralized Showroom



In the main electric shop of the Commonwealth Edison Co., located in the heart of Chicago's "loop" district, nine makes of air conditioners are on "permanent" display this summer. Purpose of the exhibit is to educate the public on air conditioning and to provide a central display room for dealers.

Air-Conditioning Installation Being Made In New York City Apartment House

NEW YORK CITY—What is believed to be New York City's first completely air-conditioned apartment house will soon be ready for its new occupants at 125 East 54th St. here.

Formerly a four-story, four-apartment building with an English basement, the remodeled structure will have two apartments on each floor, and an all-night cafe in the basement. The basement "night club," with dance orchestra platform at one end, is 45 ft. wide by 90 ft. long. The owner of the building had decided to install air-conditioning equipment in this part, but it was the willingness of tenants to pay as high as \$120 monthly for comfortable living quarters that moved him to air condition the entire structure.

These improvements, together with some slight alterations to the front of the building, will put the apartment structure in complete harmony with adjacent structures.

Engineers of the United Air Conditioning Sales Corp., Chrysler Airtemp distributor, who made the installation, advised after a study of the installation problems which the building offered, that fan-driven units be used.

As distinguished from other types of apparatus, the units resemble what are sometimes called "schoolroom" units, in that twin fans take their supply through dry wafer filters, then pass the air upwards over tubular reverse fluid coils, and then to supply ducts for delivery at desired points.

They represent a modification of room cabinets, without sheet metal enclosures.

Individual apartments consist of a living room, a bedroom, a kitchenette, and a bathroom, with necessary closet space. The conditioning units are set in the floors of the closet nearest bathroom or kitchen. The upper closet space can be used for storage. Coils are set behind and slightly above the fans, abbreviated sheet metal casings housing both fans and coils. Fan inlets are left uncovered.

In front of the conditioner units, of which there is one for each apartment, is a recirculation grille, 24x30 in., located in the front of the interior wall of the living room, at the floor. The fans discharge the air over the coils, which contain hot water under pump pressure in winter, and cold water under pressure in summer, and through concealed ducts that terminate in wall grilles, one in each room.

The grilles are near the ceilings in all apartments. Living and bed chamber grilles are 10x20 in., and those serving kitchenette and bathroom, 6x6 in. Tenants can regulate the conditioning to suit their own tastes.

Supplementing the conditioning system is an exhaust system for all toilets and kitchenettes. A single trunk duct with branches and a single fan serve all such rooms in the building. Kitchen exhaust grilles are near ceilings, while toilet room exhaust grilles are about 3 ft. above the

floor, and near seats. Grilles are 4x6 in. Odors are exhausted by a cased fan to the atmosphere above the roof.

A variation of this equipment is used in the two first floor apartments, which have recessed cast-iron radiators, faced by 4x4 ft. grilles, in the front halls. The same halls also have extra conditioned-air grilles, 10x20 in., near the ceilings. Piping to and from all apartment conditioner unit-coils is cross connected and valved so that one may, according to season, change from hot to cold or vice versa by manipulation of hand valves.

Drainage of condensate from exteriors of unit coils, when used for cooling, is by 1/2-in. pipe line to the sewer. Hot water radiation return from unit coils goes to a six-section cast iron basement heating plant.

The kitchen serving the night club restaurant is also air conditioned. The large cased fan that supplies conditioned air both to the club and to the kitchen is in the same room as the oil-fired water heater and its 1,000 gal. horizontal storage tank. This heater, in addition to furnishing hot water for all heating purposes, also supplies hot water for tenants' domestic uses.

From the standpoint of air conditioning, treatment of the night club parallels that of the apartments in interest. The night club system may be divided into three features, first of which is the large duct, 36x24 in. deep, that passes along one entire side of the room near the ceiling.

In the inward side, or face, of this duct are 16 supply grilles, 6x20 in., and 5 ft. apart, through which warm air is delivered in winter and cool air in summer. Coils are installed in a large duct near a cased supply fan in what is known as the fan room. These coils are cross connected, so they can be used either for heating or cooling.

At the floor line and toward the front end of the night club is a large grille for the exhaust of room air for recirculation. The grille, however, furnished only two-thirds of the air supply handled by the supply fan, the remainder being outside air, taken from above the roof.

Completing the club's equipment is another large duct on the opposite side of the room from the conditioning duct, also running the entire length of the room. Into the bottom of this, which is an exhaust duct, are two grilles, 24x24 in., for the elimination of smoke, and improvement of general air circulation. This duct joins the exhaust duct of the kitchen.

Small rooms have also been taken care of in the system. A 9x12 in. duct, some 90 ft. long, exhausts heat and odors from the fan room, and discharges above the roof. Additional air-conditioning and ventilating equipment takes care of a bar in the lobby of the building.

In the interior wall, above the bar, is a 6x20 in. grille for the delivery of warm air in winter, and cool air in summer, to match the general plan of conditioning for the building. In the ceiling of the lobby between the bar and the cloak room, is a grille 10x30 in. for conditioned air, while a 24x24 in. grille serves the men's toilet, across the lobby from the cloak room.

Still another exhaust grille is installed in the women's room adjacent. Since complete modernization of the building will not be completed until early autumn, the compressor intended to cool the residential sections of the building probably will not be installed until spring. The compressor and water-cooling equipment serving the night club, lobby, and other miscellaneous minor requirements, are being connected at present, and are of 15-ton capacity, with a 15-hp. motor.

9 Dealers Exhibit Units at Showroom of Chicago Utility

CHICAGO—Nine concerns are showing air-conditioning equipment in a "permanent" exhibit in the main electric shop of the Commonwealth Edison Co. here.

Purposes of the exhibit are to provide a central showroom where people may view the latest developments in the industry, to serve as an educational medium, and to provide a downtown display room for dealers and their salesmen.

Firms represented in the display are: Chicago Airtemp (Chrysler), Kelvinator, Frigidaire, Kroeschell Engineering Co. (Westinghouse), Ilg Electric & Ventilating Co., General Refrigeration Sales Co., Westerlin & Campbell (York Ice Machine), Sampson Electric (York Ice Machine), Strang Chicago Air-Conditioning Co.

Completion of System For Brooklyn Store Is Celebrated

BROOKLYN—Celebrating the completion of the largest department store air-conditioning system in the New York territory—the new installation in the Abraham & Straus store here—a group of engineers headed by Dr. James H. Kimball of the U. S. Weather Bureau met for luncheon (July 18) with leading officials of the store.

At the same time large space display advertising in New York newspapers heralded the announcement that Abraham & Straus has adopted

air conditioning for the comfort of its patrons. York Ice Machinery Corp. made the installation.

During the luncheon, Edward C. Blum, president of the store, recalled the days when heat was first recognized as the greatest obstacle to summer business, and told about some of the weird devices that were used to create a cool psychology in the minds of customers.

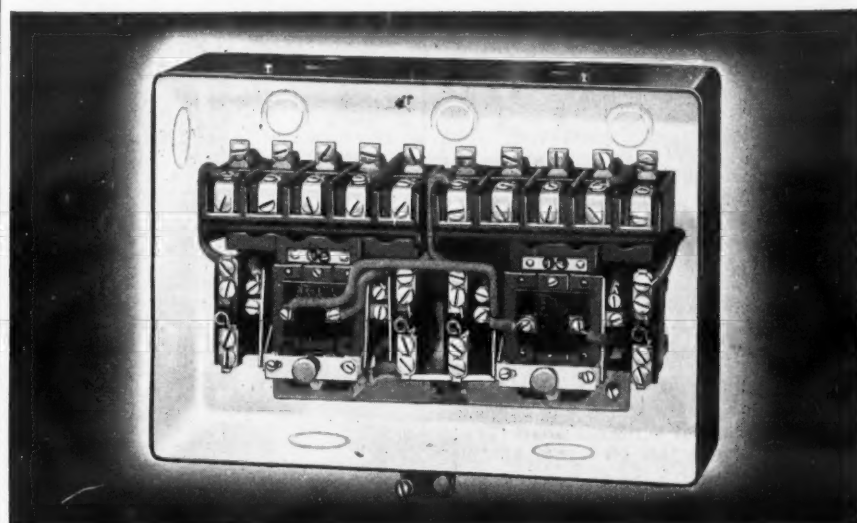
"Years ago," he said, "we used to roll water wagons among our customers and serve them with oatmeal water, the current fad being that it cooled the blood and reduced the temperature. We also initiated the custom of giving away highly ornate fans to help our customers keep cool."

"The effect of air conditioning on our business has already been quite gratifying," Mr. Blum remarked, "with this month's business substantially ahead of July, 1934."

Among the other guests attending the luncheon were John James of the American Society of Heating & Ventilating Engineers; David L. Fiske, secretary of the American Society of Refrigerating Engineers; S. J. Shipley, vice president of the York Ice Machinery Corp.; Howard V. Shipley, sales manager of York's Brooklyn office; Walter Rothschild, vice president and general manager of Abraham & Straus; and Robert E. Blum, Richard H. Brown, Kenneth C. Richmond, Neal D. Mooers, and Sidney Solomon, all vice presidents of the store.

Abraham & Straus' air-conditioning system employs a York Freon refrigerating plant rated at 1,050 tons of refrigeration, and will circulate 405,000 c.f.m. of conditioned air.

Refrigerating equipment, installed in the basement of the store, includes three 15x13 1/2 in. York 4-cylinder Freon compressors, two 60 in. by 16 ft. condensers, one 43 in. by 16 ft. water cooler, and two 53 in. by 16 ft. water coolers.



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Bulletin 715's double-break, silver-alloy contacts require no maintenance. Resisto-therm relays provide overload protection. There is ample wiring space. Three-wire control gives no-voltage protection—two-wire control, no-voltage release. Maximum ratings: 30 H.P., 220 V.; 50 H.P., 440-550 V. Also available for three and four-speed motors.

Manual and Automatic Starters for Refrigeration Service

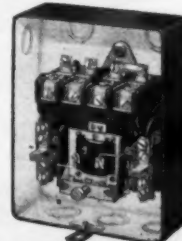
Bulletin 609 Manual Starter

A simple, compact starting switch for small across-the-line A. C. motors. Push buttons operate its quick make-and-break action. Has resisto-therm overload relays, double-break, silver-alloy contacts, white interior, and ample wiring space. Maximum ratings: single-phase, 3 H.P., 220 V.; polyphase, 5 H.P., 220 V.; 7 1/2 H.P., 440-550 V.



Bulletin 709 Automatic Starter

A compact, solenoid-type magnetic starter for across-the-line A. C. motors. Provides remote control and no-voltage protection. Has double-break, silver-alloy contacts and resisto-therm overload relays. Can be mounted directly to metal without additional insulation. Maximum ratings: 15 H.P., 110 V.; 30 H.P., 220 V.; 50 H.P., 440-550 V.



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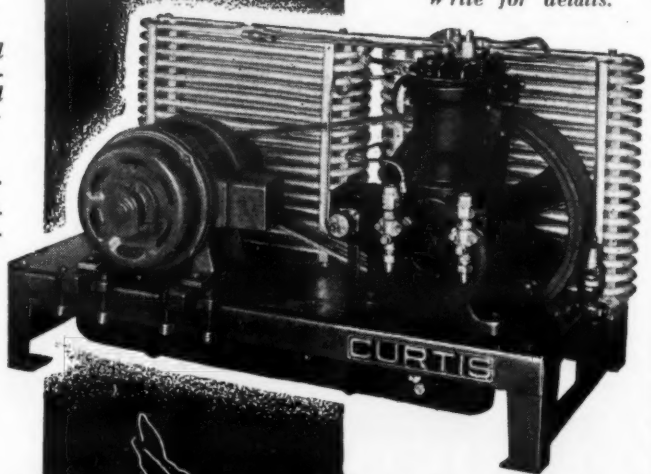
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SERVICE

Operating Problems of Low Pressure Controls

68. Low Pressure Controls

There are two separate principles employed to actuate the motor control mechanism. The low pressure control, so-called because it operates on the pressure within the low pressure side of the system, is a very common type of motor control used on both single and multiple systems to maintain the correct refrigerator temperature.

The temperature control or thermostatic control is so labeled for it is actuated by the pressure created within a thermostatic bulb and power element, by the changes in temperature of a volatile thermostatic liquid usually a refrigerant.

It is known that when a cylinder of liquid refrigerant is subjected to a given temperature that there is always a very definite corresponding pressure upon the liquid refrigerant, being exerted by the saturated vapor. When the temperature of this confined liquid is increased, there is always a corresponding increase in pressure, and vice versa.

It is also known that when a flooded system employing either the low side or high side float, or a dry system using the thermostatic expansion valve, is in normal operation, that the temperature of the evaporator gradually decreases throughout the operating cycle.

As the temperature decreases, so does the pressure within the low side of the system. During the off-cycle, this lower pressure gradually increases with the gradual increase in temperature due to heat leakage and other factors causing the refrigerator temperature to rise.

It is these temperature and corresponding pressure changes that form the basis of both thermostatic and low pressure controls.

The low pressure control actually employs the natural pressure changes in the low side of the system. This principle is shown in Fig. 111. Flexible metal bellows B is connected to the suction line of the system with a small copper tube. The weight W is shown holding the bellows compressed and the electrical contacts open. This would represent the off cycle of the system.

As the refrigerator temperature increases, so does the temperature of the evaporator. As the evaporator temperature increases, the liquid refrigerant within is being vaporized, gradually increasing the pressure in the low side and since the bellows is connected into this part of the system, the increase in pressure responds on the bellows causing it to elongate or expand.

The pressure continues to increase,

Master Service Manual Starts to Take Form

Published in this issue is the first part of Chapter 6, Instalment 1 ("Low Pressure Controls") of the Master Service Manual, prepared by K. M. Newcum. The manual is being published serially in Electric Refrigeration News first instalment appearing in the April 10, 1935, issue. When all the chapters have been published in the News, the information will be put in book form, with considerable other supplementary material.

This manual of information on the design and operation of present-day refrigeration systems will add to the service man's knowledge, and will assist him in meeting specific problems in servicing operations in the field.

Following is an outline of the material and the dates of the weekly issues of Electric Refrigeration News in which the material was published:

Chapter 1—THEORY OF REFRIGERATION (April 10).

Chapter 2—PRINCIPLES OF MECHANICAL REFRIGERATION (April 17).

Chapter 3—COMMON REFRIGERANTS (April 24).

Chapter 4—CONDENSING UNITS.

Instalment 1: description of various compressor parts (May 1).

Instalment 2: stuffing box seals, flywheels, and direct-connected units (May 8).

Instalment 3: rotary compressors (May 29).

Instalment 4: care and servicing of shut-off valves and gaskets (June 5).

Instalment 5: condensers (June 12).

Instalment 6: liquid receivers (June 19).

Chapter 5—EVAPORATORS.

Instalment 1: flooded evaporators with low side float valve (June 26).

Instalment 2: high side float valves and flooded evaporators (July 3).

Instalment 3: automatic expansion valves (July 10 and 17).

Instalment 4: thermostatic expansion valves (July 24).

Also published in this issue is No. 16 of "Installation Operations" and "Service Operations," a series of lessons outlined for the use of the service manager in instructing beginners in installation work.

and the bellows continues to elongate until its movement has moved the weight upward and the contact arm downward, allowing the contacts to meet starting the motor, and the on cycle. This pressure point is known as the "cutting-in" point.

As the compressor continues to draw the heat laden gas from the evaporator, its temperature and pressure is gradually decreasing, and the bellows by the force of the weight is again returning to its original shape to a point where the electrical contacts break stopping the motor. This is known as the "cutting-out" point.

This normal operation of the control continues with the normal temperatures and forms regular cycles of the system. The cutting-in point is determined by the pressure existing when the maximum temperature is reached, and the cutting-out point is determined by the minimum temperature.

The time the system remains in operation, and out of operation, depends largely on the usage of the refrigerator, and the temperature of

the room in which the refrigerator is located. In a warm room, the system will remain on longer, that is, a longer on-cycle, than in a colder room, for the system must operate longer to remove the increased amount of heat which is constantly leaking into the cabinet.

No definite time may be assigned to the length of either the on or off-cycle, as they are determined by the refrigerator temperature.

Inasmuch as the low pressure control is a definite part of the low side of the system, it is affected by any mechanical irregularities that may exist in that part of the system. It is well to consider the effect of certain conditions on the control.

In a low side float system, a shortage of refrigerant will cause the float to remain open. With the float open the high pressure gas is admitted to the low pressure side of the system. So long as this shortage continues the pressure in the low side will be higher than normal, and the compressor may be unable to reduce low pressure sufficiently to allow the low-pressure control to cut out. Continuous operation will result.

If the shortage is only slight, the compressor may reduce the low side pressure to the cutting out point of the control after a long on cycle, but as there is a constant inflow of higher pressure gas, the low-side pressure will very rapidly increase to the cutting-in of the control starting the system after only a very short off-cycle.

A leaking float valve will have the same effect upon the length of the cycles and the operation of the control. The effect upon the refrigerator temperature is different, for with a leaky float valve, resulting in a longer on cycle, the refrigerator temperature may be lowered beyond the freezing point.

A leaky discharge valve by allowing high pressure gas to leak through from the condenser into the low side, will cause long on cycles and short off cycles.

A high side float system using the low pressure control will be similarly affected by a leaky discharge valve. A leaky high side float valve will have the same effect on the control as the leaky low side float.

A shortage of refrigerant will have an opposite effect on the control to that of the low side float system. The shortage in the high side float chamber prevents the float from rising and opening, and an insufficient amount of refrigerant is supplied to the evaporator, resulting in lower than normal pressure in the low side. The on cycle under these conditions will be very short, and off cycle may also be abnormal.

An overcharge of refrigerant in the high side float system will give the same effect as a leaky low-side or high-side float valve, with longer on-cycles and shorter off-cycles.

The low pressure control may be defined as being a control that operates on the thermostatic principle, using the evaporator as the thermostatic bulb and the refrigerant contained therein as the thermostatic liquid.

Cutler-Hammer Brings Out Overload Switch

MILWAUKEE—Modern appearance and a different, simple mechanism are combined in the new Cutler-Hammer model 5101 pushbutton motor starter, adaptable for any fractional horsepower application.

The switch provides protection against overloads with a free-tripping thermal overload mechanism. An overload is instantly indicated in the switch itself by the return of the operating button to the "off" position. One operation—pushing the "start" button—resets the overload mechanism and re-starts the motor.

Capacity of the switch can be varied to provide protection for different sizes of motors by changing the heater coil.

Flexibility in mounting is incorporated. It can be used for surface mounting, and as a built-in control with the self-contained bracket for front mounting, or without the bracket for back or cavity mounting.

Installation of Low Pressure Control

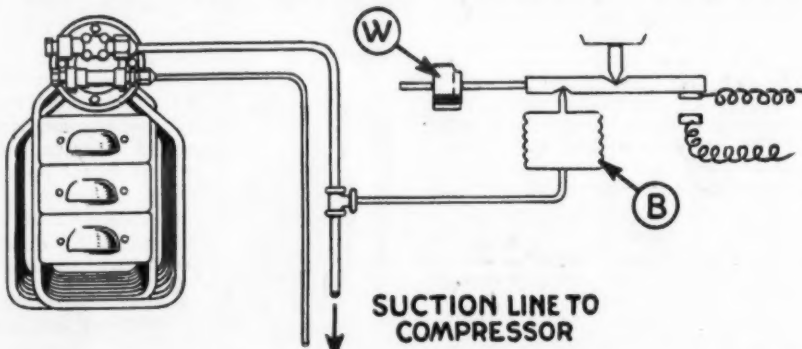


Fig. 111—Frigidaire low-pressure control used on household electric refrigerator. B indicates a flexible metal bellows which is connected to the suction line of the system. The weight W is holding the bellows compressed and the system is on the off cycle.

SERVICE OPERATIONS

A SERIES OF LESSONS OUTLINED FOR THE USE OF THE SERVICE MANAGER IN INSTRUCTING BEGINNERS IN SERVICE WORK

No. 16—Changing Flooded Evaporator Equipped with Shut-Off Valves

By K. M. Newcum

REASON:

It is necessary to perform the following operation when an old coil is to be replaced with a new one of the same size and which is fully charged with the correct amount of refrigerant and oil.

PROCEDURE:

- Attach a compound gauge to the suction line shut-off valve on the compressor.
- Evacuate the liquid line. Refer to Operation No. 1.
- Evacuate the suction line. Refer to Operation No. 4.
- Disconnect the suction and liquid lines from the shut-off valve on the coil, and insert flare plugs in openings and seal caps on the shut-off valves.
- Loosen the coil hanger bolts or supports and remove the old coil.
- Hang the new coil in place and check with level.
- Remove seal caps from new coil, and flare plugs from liquid and suction lines.
- Connect both liquid and suction lines to shut-off valve on the new coil.
- Purge both lines. Refer to Operation No. 5.
- Test for leaks. Refer to Operation No. 7 if sulphur dioxide, and Operation No. 8 if methyl chloride.
- Check with instructor before opening valves and putting job into operation.
- After checking with instructor, open all valves to their respective operating positions and put compressor into operation.
- Check with instructor.

Fogel Case, M & E Unit Sold to Market in Philadelphia

PHILADELPHIA—Fogel Refrigerator Co. recently completed installation of a 10-ft. display case, with 15 ft. of counter extensions, in Pino's Quality Market, 1707 South Twelfth St., here.

The case uses Fogel's air-flow coils, and a ½-hp. model 325-MC Merchant & Evans refrigeration unit. Feature of the case is a special double-air circulation baffle, which reduces considerably dehydration and shrinkage losses.

The manager of the market reports a substantial increase in business volume, which he attributes to being able to display his line of meats in the display case instead of keeping them in the walk-in cooler, as was formerly the case.

De Waal Service Company Opened in San Antonio

SAN ANTONIO, Tex.—Stanley De Waal, for the past 10 years associated with the San Antonio branch of Frigidaire Corp. and the Straus Frank Co., local Frigidaire distributor, has opened his own independent service company, Electric Refrigeration Service, at 201 Rigby Ave. here.

For six years, Mr. De Waal was with the local Frigidaire branch's service department, three of them as district service manager. His four years with Straus Frank Co. was in a similar capacity.

In his new business, Mr. De Waal will handle all phases of refrigeration service, as well as buy and sell used household and commercial refrigeration equipment.

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LARKIN COILS
for...
AIR CONDITIONING

Utilities Engineering Sales, Parts Jobber, Reorganized As Airo Supply Co.

CHICAGO—Completing its recent reorganization, the Utilities Engineering Sales Co., here will henceforth be known as Airo Supply Co., E. P. Sorensen, president of the company announces.

Expansion in all departments, and the addition of a more complete stock of refrigeration parts, tools, supplies, and accessories, have been made possible through the inclusion of a larger floor space.

Lines recently added to the refrigeration and air-conditioning supplies handled by the company include Starr Freeze compressors and condensing units, all Fedders products, piston rings, hard copper tubing in sizes from ½-in. O.D. to 2½-in. O.D., and a variety of special tools.

Gilmer Introduces Oil Resistant Belt

PHILADELPHIA—Just introduced by the L. H. Gilmer Co. is a new type of belt claimed to be 100 per cent oil resistant. It is made in both the V-type and flat kable-kord type.

Mechanically, the belt has the same qualities as the regular Gilmer rubber-fabric type of belt. Materials used, however, are said to make the belt practically impervious to oil.

Thousands of the belts have been in operation in the field.

OFFICIALLY ENDORSED BY MANY LEADING FIRMS

If you knew nothing about Refrigeration and Air Conditioning Institute Training except that it is officially endorsed by twenty of the industry's leading manufacturers... that in itself... should indicate its superiority. These firms cooperated in the preparation of the training. They are recommending it. They have appointed their own engineers to supervise it.

Dealers... Distributors... interested in obtaining properly trained men for installation and service work... ambitious men... who are interested in a future in this big new industry... GET THE FACTS. Write for details of the training and a list of the manufacturers who endorse it.

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- MCCORD RADIATOR & MFG. CO., DETROIT

Need of Independent Service Men Cited by Institute Governors

CHICAGO—The need for better trained independent service men, particularly in the smaller communities, was emphasized by representatives of leading manufacturers at the third conference of the board of governors of the Refrigeration and Air Conditioning Institute here recently in the Edgewater Beach Hotel.

The conference also discussed and reserved for future study a tentative two-weeks' shop training course, in which Institute students would be instructed in the use of leading manufacturers' equipment at the completion of their course of home study, before being given their diplomas.

Board of Governors

On the board of governors were L. K. Baxter, Westinghouse Electric & Mfg. Co.; E. A. Siebert, Kelvinator Corp.; C. L. Olin, Servel, Inc.; A. G. Sutcliffe, Ilg Electric Ventilating Co.; C. R. D'Olive, Stewart-Warner Corp.; and J. R. Cameron, Norge Corp.

Members of the Institute's staff, including Ray D. Smith, president; F. L. Howard, chief of staff; C. H. Smith, vice president; H. P. Manly of the editorial department; Frederic Wellman, secretary; and E. C. Kirk, eastern sales manager, were also present at the meeting.

Problem of the independent service man was first brought up by Mr. Baxter, who suggested that the Institute make a special effort to line up students in the south, southeast, and southwest sections of the country, in which its enrollment is now low.

Service Needed in Rural Areas

His company, he said, was interested in obtaining more and better service men in these sections of the country, rather than in the more densely populated northern and eastern sections, in which there are today service men aplenty. Cities of considerable size in the north, he added, present no service man problem—but smaller towns and the less populated districts offer a wide field for development.

Mr. Siebert added to Mr. Baxter's territory such states as Nebraska, Kansas, and Iowa, particularly the sections populated rather sparsely.

Here, he said, little effort was being made to sell commercial refrigeration equipment, because there were no men available who could service it, much less be trusted with the work of installation.

Program Recommended

Vigorous recruiting of students in those sections, with the idea of working as independent service men, handling the installation and servicing of all equipment in their community, regardless of manufacture, was advocated by all board members.

Recognizing the trend toward independent service men, especially in the smaller communities, and realizing that this trend is largely the result of economic conditions, manufacturers consider it most desirable that the

Checker-Shirted Service Men



"Call for the boys with the checkered shirts," has become a byword of electric refrigerator users in the territory around Merced, Calif. Earl and Lee Wright find the distinctive outfits an A-1 advertising medium.

men handling service and installation jobs in those sections be well trained in all types of problems, it was explained.

Improvement of service conditions in these smaller localities is considered most important, in view of the many commercial installations being made at the present time, as well as the potential market there in the future.

To Concentrate Effort

It was suggested that electricians, electrical contractors, independent service men, and even handy-men in these various communities, all of whom are, in some way, engaged in refrigeration service work, be asked to cooperate in seeing that at least one man in their community is school-trained, and equipped to handle any sort of refrigeration and air-conditioning problem.

In line with these suggestions, the Institute's sales plan will be changed and efforts concentrated in these sections of the country in which the scarcity of well-trained service men presents the biggest present problem to the industry.

Shop Routine Outlined

Outlines of the routine for the shop training course, broken down by days, hours, and parts of hours, were presented by Mr. Howard and Mr. Olin, Mr. Baxter, and Mr. Sutcliffe. The programs were based on an assumed attendance of 88 hours during the two-week period.

An important phase of the shop work, it was pointed out, was to start the student out with some actual hand operation, rather than in a study or review of something he had already covered in his study at home. Getting him interested in the operation by actually doing it, rather than trying to interest him through the study and demonstration of why the operation is made, will be more beneficial to the student in the long run, it was agreed.

Definite settlement of the routine

Brothers Capitalize on Distinctive Outfits To Get Business

MERCED, Calif.—Known as the "Checker-Shirted Service Men," Lee and Earl Wright, Lee's Electrical & Refrigerator Service Co., have capitalized on their novel apparel to obtain service business on refrigerators in Merced and throughout the Joaquin Valley.

The Wright brothers wear black and white checkered shirts, with checks about 1 in. square, and 10-gal. hats.

was delayed until the board of governor's next meeting, by which time all members will have had a chance to study all the routines suggested, and arrive at a conclusion regarding the merits of each.

Purchase of equipment to be used in the shop training course has been started, the report on the amount and type of equipment acquired to be made at the next board meeting. Most of the cooperating manufacturers have arranged for purchase of their material by the Institute at a discount.

It is planned to have in the school's shop at least one piece of the latest type of equipment put out by each cooperating manufacturer. Purchase of additional equipment will be made as and if financial conditions permit.

Selling to Be Taught

A new addition to the school's technical course of training will be instruction in the business side of selling and servicing of refrigeration and air-conditioning equipment. This will be valuable, it is felt, because many men, proficient as service men, fail utterly when confronted with sales problems, and even simple problems of record keeping and other features of sales work.

This training, the governors thought, would be of special worth to those who intended to operate as independent service men.

Instructions Prepared

Ten work sheets have been prepared as part of this phase of the training. Their general titles are:

The business end of refrigeration and air conditioning, the operation of a successful business, operating a retail store successfully, the successful operation of a contracting business, operating an independent service business successfully, where refrigeration is sold, your work as a salesman, your product and its competition, making the sale, and getting the order.

Most of the material in these work sheets has been drawn from the Institute's own experience in teaching men the business end of electrical work, as well as from the experience of successful merchandisers in this field.

Explains Schools Operation

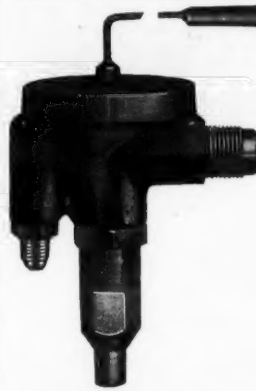
In explaining the details of the school's operation, Vice President C. H. Smith showed the governors a large map, divided into sales districts, and showing just where the Institute is concentrating its promotional activity.

Instruction material is prepared carefully, each manufacturer's methods being studied to determine the average opinion of the industry on all subjects. Exceptions are all noted. Compiled, one subject at a time, from the instructions of all manufacturers, the material is next rewritten, boiled down, and simplified for students' use.

Students are handled individually, the instruction department checking, criticizing, and grading each student's efforts, and the consultation department helping the student to get the most out of his training as well as giving assistance with problems which arise, both in his studies and in his work outside the scheduled routine of the lessons.

BUYER'S GUIDE

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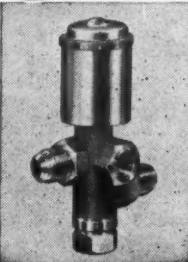
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Rempe "FIN COIL" Co.

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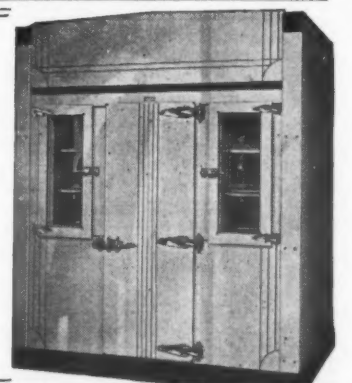
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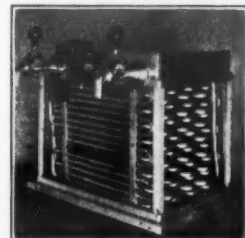
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INSTALLATION OPERATIONS

A SERIES OF LESSONS OUTLINED FOR THE USE OF THE SERVICE MANAGER IN INSTRUCTING BEGINNERS IN INSTALLATION WORK

No. 16—Installing Compressor in Machine Compartment of Refrigerator Cabinet

By K. M. Newcum

TOOLS NEEDED:

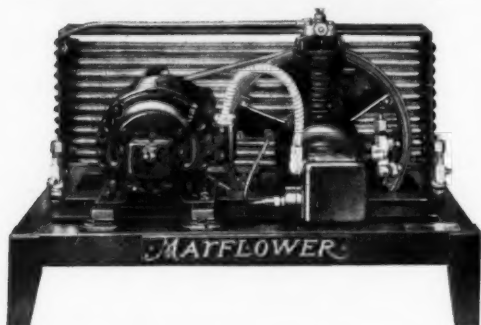
Level, oil can, adjustable wrenches, and screw driver.

PROCEDURE:

1. Check over mounting assembly as there are several different methods employed.
2. Place hanger or mounting assembly in place on compressor or in machine compartment.
3. Lift and place compressor into place in bottom of cabinet.
4. Connect or place compressor on hanger or mounting assembly.
5. Check with level.
6. Oil motor bearings.
7. Check belt tension.
8. See that compressor is free, i.e. not binding or bumping against any parts of the cabinet.
9. See that compressor is as solid as is permitted by the hanger or mounting assembly employed, yet free to rock or swing, as the case may be, so that the majority of vibration will be absorbed by the hanger or mounting assembly and not be transmitted to the cabinet, while the compressor is in operation.
10. Check with instructor.

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FREEZER CASES
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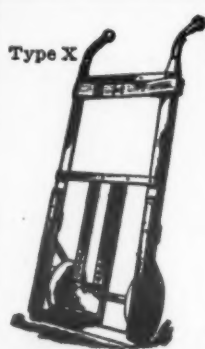
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Head Pressure Range 35-185 lb. Ga. Std.
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Sizes 1/2" to 3" std. female pipe threads

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New York City New Jersey Pittsburgh, Pa.

PATENTS

Issued July 16, 1935

ISSUED JULY 16, 1935

2,008,091. SLIDING SHELF. Earl L. Betts, Battle Creek, Mich., assignor to United Steel & Wire Co., Battle Creek, Mich., a corporation of Michigan. Application Dec. 16, 1931. Serial No. 581,345. 12 Claims. (Cl. 211-143.)

2,008,154. APPARATUS FOR COOLING DRAUGHT BEVERAGES. Robert D. Pike, Piedmont, and Wolcott P. Stanton, Berkeley, Calif. Application July 25, 1933. Serial No. 682,054. 7 Claims. (Cl. 225-1.)

2,008,198. VALVE. Paul W. Beggs, Chicago, Ill., assignor to Jas. P. Marsh Corp., Chicago, Ill., a corporation of Illinois. Application April 29, 1933. Serial No. 668,607. 6 Claims. (Cl. 137-153.)

2,008,202. WATER COOLER. Harry E. Cullen and Henry O. Ronning, Minneapolis, Minn., assignors to Henry P. Pillsbury and Bessie Watson executors of said Henry P. Watson, deceased. Application Nov. 4, 1931. Serial No. 572,971. 15 Claims. (Cl. 62-115.)

2,008,203. REFRIGERATOR DISPLAY CASE. Roland P. Daemick, Chicago, Ill., assignor to The Daemick Co., Chicago, Ill., a corporation of Illinois. Application May 5, 1934. Serial No. 724,090. 5 Claims. (Cl. 62-103.)

2,008,255. COUNTER FLOW AIR CONDITIONER. Lester U. Larkin, Atlanta, Ga., assignor to Larkin Refrigerating Corp., Atlanta, Ga., a corporation of Georgia. Application Nov. 16, 1933. Serial No. 698,291. 2 Claims. (Cl. 257-244.)

2,008,259. ELECTRICAL SYSTEM FOR REFRIGERATING MECHANISM. Edwin M. Post, Jr., New York, and George O. Hanshaw, Forest Hills, N. Y., assignors to International Motor Co., New York, N. Y., a corporation of Delaware. Application Aug. 3, 1932. Serial No. 627,311. 1 Claim. (Cl. 175-375.)

2,008,269. HEAT INTERCHANGE DEVICE. Francesco B. Whittemore, Jackson Heights, and William J. Perkins, Brooklyn, N. Y., assignors to International Motor Co., New York, N. Y., a corporation of Delaware. Application Feb. 18, 1933. Serial No. 657,368. 9 Claims. (Cl. 62-102.)

2,008,303. REFRIGERATOR AND FOOD STORAGE DEVICE PARTICULARLY THEREFOR. Robert Lay Hallock, Larchmont, N. Y. Application Oct. 24, 1934. Serial No. 749,726. 18 Claims. (Cl. 62-89.)

2,008,315. REFRIGERATOR SHELF STRUCTURE. Norman W. Schmidt, Dayton, Ohio, assignor, by mesne assignments, to General Motors Corp., a corporation of Delaware. Application July 30, 1931. Serial No. 554,057. 2 Claims. (Cl. 211-153.)

2,008,323. CONTROL DEVICE. George Bethune Duffield, Detroit, Mich., assignor to Detroit Lubricator Co., Detroit, Mich., a corporation of Michigan. Application June 22, 1933. Serial No. 676,988. 14 Claims. (Cl. 236-44.)

2,008,343. COOLING ELEMENT FOR REFRIGERATING SYSTEMS. Albert R. Thomas, New York, N. Y., assignor to Electroflux Serval Corp., New York, N. Y., a corporation of Delaware. Application Dec. 2, 1932. Serial No. 645,432. 10 Claims. (Cl. 62-99.)

2,008,407. INVERTED-REFRIGERATION PLANT. Herman J. Stoeber, Wilkinsburg, Pa., assignor to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a corporation of Pennsylvania. Application April 28, 1932. Serial No. 607,940. 5 Claims. (Cl. 62-115.)

2,008,549. REFRIGERATING APPARA-

TUS. John A. Grier, New York, N. Y., assignor, by mesne assignments, to General Motors Corp., a corporation of Delaware. Application Dec. 17, 1929. Serial No. 414,725. 11 Claims. (Cl. 62-3.)

2,008,581. LUBRICATING SYSTEM. French E. Dennison and William D. Leonard, York, Pa., assignors to York Ice Machinery Corp., York, Pa., a corporation of Delaware. Application Dec. 27, 1933. Serial No. 704,197. 9 Claims. (Cl. 308-121.)

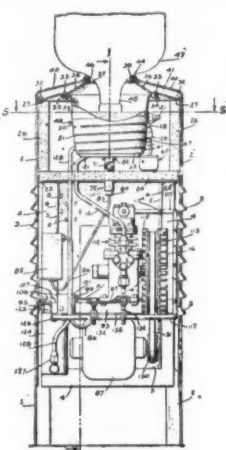
2,008,628. DEFROSTER FOR REFRIGERATORS. Alonzo W. Kuff, York, Pa., assignor to York Ice Machinery Corp., York, Pa., a corporation of Delaware. Application Sept. 3, 1930. Serial No. 479,542. 25 Claims. (Cl. 62-115.)

Gardner-White Joins Merchandising Group

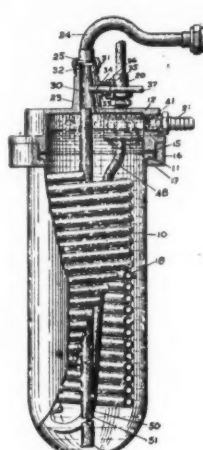
CHICAGO—Gardner-White Co., with three stores in Detroit, has joined the Western Merchandising Corp., announces H. G. Davis, merchandising counselor and secretary of the organization. R. L. Mehornay is president of the group, which has offices in the Furniture Mart here.

Western Merchandising Corp. now includes the following stores:

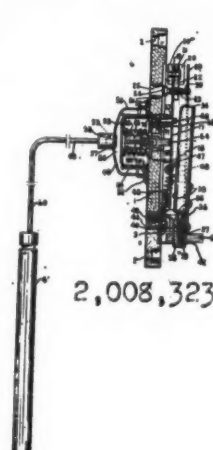
American Furniture Co., Denver; The Emahizer-Spielman Furniture Co., Topeka, Kan.; Harbour-Longmire Co., Inc., Oklahoma City; Hellrung & Grimm, St. Louis; New England Furniture Co., Minneapolis; C. Niss & Sons, Inc., Milwaukee; North-Mehornay Furniture Co., Kansas City; Peterson Furniture Co., Chicago; G. A. Stowers Furniture Co., San Antonio, Tex.; Houston, Tex.; Laredo, Tex.; and Cuero, Tex.; King Furniture Co., San Antonio, Tex.; and Brady-Mahornay Co., St. Joseph, Mo.



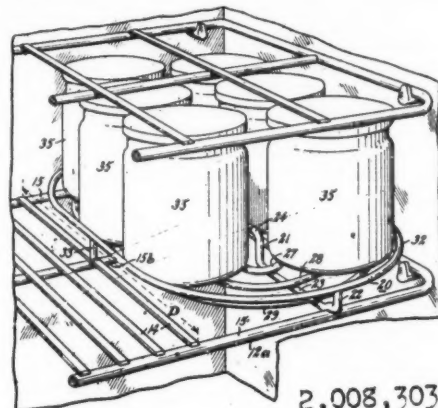
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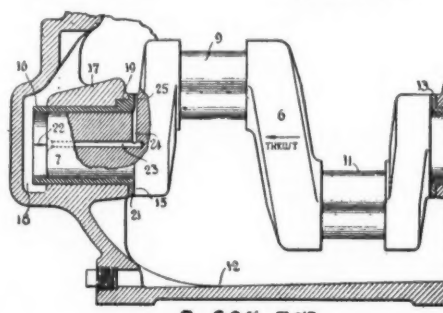
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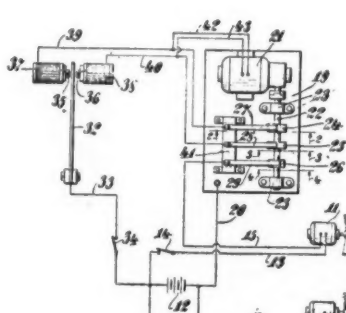
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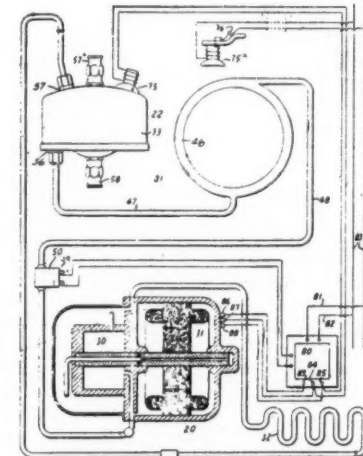
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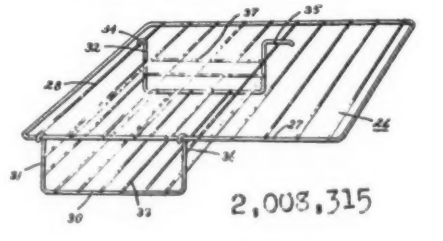
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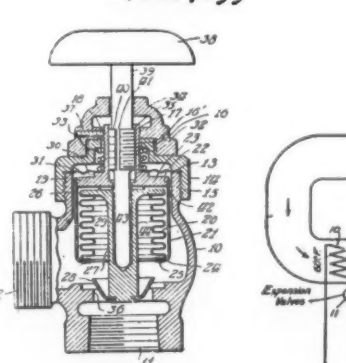
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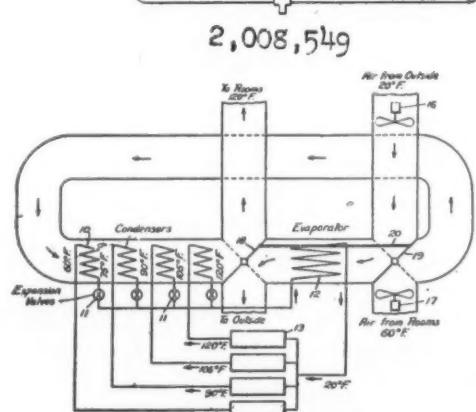
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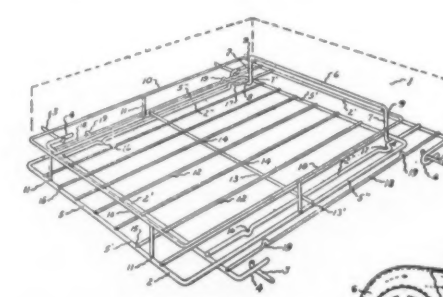
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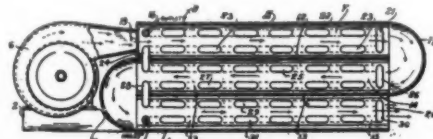
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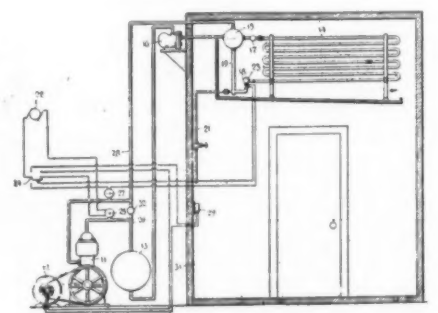
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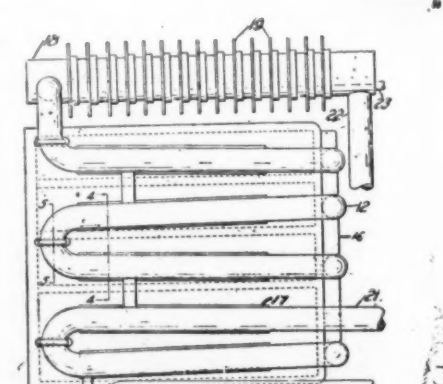
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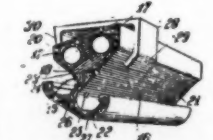
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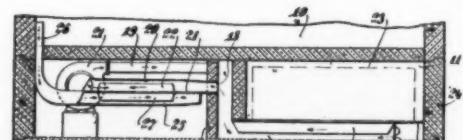
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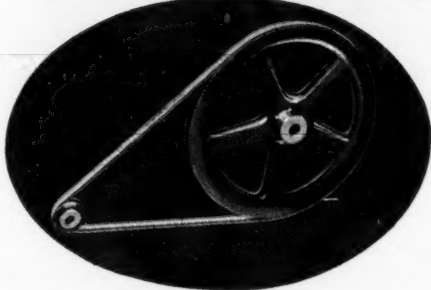
2,008,269

DAYTON V-BELTS

There is a Dayton V-Belt made especially for all makes and types of refrigerators, washing machines and other appliances. A stock is available near you. Send for price list and name of your nearest distributor.

THE DAYTON RUBBER MFG. CO.
DAYTON, OHIO

The world's largest manufacturer of V-Belts



QUESTIONS

'Socold' Service Data

No. 2374 (Service Man, Pennsylvania)—"I would like you to furnish me information as to the repair and service of an old Socold electric refrigerator."

"This refrigerator is about five years old and is said to have cost about \$375, and at present has some damaged parts. Could you let me know if these parts can be had as I understand that this is an orphan machine?"

Answer: Complete service instructions on the Socold electric refrigerator were published in the May 15 and May 22 issues of ELECTRIC REFRIGERATION NEWS this year.

These articles on the Socold refrigerator are part of a series of articles which we have published in the last year on service instructions for many different makes of orphan refrigerators.

Commercial Sales

No. 2375 (Statistics Company, New York)—"Would you be good enough to send us sales of commercial refrigeration units in 1934—the figures that are comparable to the units sold in 1933 which, according to your compilation, were 102,458?"

Answer: Sales of commercial condensing units and also sales of other commercial applications may be found in the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK.

Household Specifications

No. 2376 (Insurance Company, New York)—"We understand that it is your practice to issue annually in the June 3 issue of ELECTRIC REFRIGERATION NEWS a survey of the electric refrigerators manufactured in this country, giving such information as the names of the different manufacturers, types, models, characteristics, etc. We would like very much to obtain a copy of this issue as we insure equipment of this kind against breakdowns of all kinds."

Answer: See below.

No. 2377 (Repair and Sales Company, Illinois)—"Have you published an encyclopedia of refrigerators, their units, and chemicals used in each?"

Answer: Specifications of all leading makes of household electric refrigerators were published in the June 12 issue of ELECTRIC REFRIGERATION NEWS.

Capillary Tube Systems

No. 2378 (Manufacturer's Representative, California)—"Will you be good enough to advise me what manufacturers are using the capillary tube system with the evaporators in domestic refrigeration?"

"If this information is in any of your issues please advise date and I will refer to my copies."

Answer: See below.

No. 2379 (Manufacturer, Ohio)—"Will you kindly advise whether you know of any technical data on capillary tube systems of refrigeration available particularly the relationships between diameter of opening and refrigerant flow and, for any one size, the length of tube in relation to the refrigerant flow."

Answer: The capillary tube was developed several years ago by the company which manufactured the Rice refrigerator, which is no longer being made. Crosley is the principal user of this system at the present time. Servel used it in its hermetic machine.

A brief description of the capillary tube system was published on pages 12 and 13 of the Oct. 25, 1933, issue of ELECTRIC REFRIGERATION NEWS. Published on pages 1 and 2 of the Jan. 10, 1934, issue of the News was a story concerning the use of the capillary tube with the Crosley machine, and a service chart for capillary tube units.

For further information you might write Isaac Rice, Jr., 295 Fifth Ave., New York City.

Sales for 1934 & 1935

No. 2380 (American Representative of German Manufacturers)—"We would very much appreciate it if you could advise us what the total sale of the refrigeration industry was in dollars and the number of refrigerators sold during 1934 and the first half of 1935."

Answer: ELECTRIC REFRIGERATION NEWS estimated that in 1934 manufacturers of household electric refrigerators in this country sold a total of 1,390,000 units to distribution outlets in this country and abroad, with a total value of \$239,000,000.

Figures for the first six months haven't been made available, but preliminary estimates show that approximately 1,000,000 household electric refrigerators were sold by manu-

facturers to distributors during the first five months of 1935.

All available statistics and market data of the refrigeration and air-conditioning industries for 1934 and previous years is published in the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK.

Monthly sales figures reported by members of the Refrigeration Division of National Electrical Manufacturers Association are published in ELECTRIC REFRIGERATION NEWS.

Bancredit Corp. Address

No. 2381 (Distributor, Ohio)—"In your REFRIGERATION NEWS, edition of June 26, we read the article on 'Bancredit Plan of The First Banccredit Corporation.'"

"While you state in the article that they are operating in New York, Chicago, and Philadelphia, there was no street address given. Someone told me that they thought there was an office in Detroit or that someone up there, knew about their plan. I would be very glad if you would give me the address of their main office that we might obtain all of the information about this new finance plan and also the address of a Detroit office providing they have one."

Answer: Write either to Mr. L. M. Lilly, President, First Banccredit Corp., First National Bank Building, St. Paul, Minn.; or its branch office in the Penobscot Bldg., Detroit, Mich.

Commercial Market

No. 2382 (Manufacturer, Ohio)—"We are very much interested in securing figures which will give an idea of the market potential in the following fields of the commercial business, together with the sales by years."

Meat Markets and Groceries
Restaurants
Institutions
Hotels
Hospitals
Water Cooling
Beer Cooling
Milk Cooling
Ice Cream Cabinets.

"We note that you give the sales by years of water cooling, ice cream cabinets, and compressors in your 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK, but thought you might have a break down by markets."

Answer: We believe you overlooked one part of the 1935 REFRIGERATION AND AIR CONDITIONING MARKET DATA BOOK, namely, page 74 which gives an analysis of commercial sales.

Specific estimates are shown for sales of ice cream cabinets, commercial cabinets and display cases, and water coolers. The table for other applications includes sales of beverage coolers, room coolers, miscellaneous special boxes, and also extra commercial low sides sold separately.

Gasoline Unit

No. 2383 (Dealer, Kansas)—"We have been informed that there is a company in Detroit, who manufactures a gasoline operated refrigerator. We have been unable to locate this company."

Answer: Waukesha Motor Co., Waukesha, Wis., makes a gasoline-operated refrigerator.

Refrigerants Used

No. 2384 (Serviceman, Wis.)—"I would like to know if your REFRIGERATION DIRECTORY has the name and amount of refrigerant used in all makes of household machines."

Answer: The DIRECTORY does not include the name and amount of refrigerant used in all makes of household machines, this information being contained in the specifications of household electric refrigerators published in the June 12 issue.

Absopure Manual

No. 2385 (Manufacturer, Missouri)—"We have a letter from a dealer in Canada requesting a book of instructions on the Absopure Electric Refrigerator."

"It is my understanding that you have a department organized to handle inquiries of this kind, particularly on electric refrigeration machines which are no longer being manufactured."

Answer: Service data with drawings on both the series E and F Absopure compressors were included in the July 18, 25, and August 1, 1934 issues of ELECTRIC REFRIGERATION NEWS. These were commercial units, but I believe the principles covered would apply to the household unit.

For further information concerning the Absopure electric refrigerator, address Universal Cooler Corp., 7424 Melville Ave., Detroit, Mich., which took over the Absopure company.

Maker of Coldspot

No. 2386 (Serviceman, New York)—"Please submit to me the address of the manufacturer of the Coldspot refrigerator carried by Sears Roebuck."

Answer: Refrigerating unit for the Coldspot refrigerator is made by the Sunbeam Electric Mfg. Co., 225 W. Morgan Ave., Evansville, Indiana. Cabinets are made by the Seeger Refrigerator Co. of St. Paul, Minn.

CLASSIFIED

RATES: Fifty words or less, one insertion \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Electric Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS AVAILABLE

WANTED IMMEDIATELY, refrigeration and air conditioning man with practical experience in the field; and in routine and conduct of factory training school. Position now open with large educational institution offers unusual opportunities. Give sufficient details in letter so interview may be arranged without further correspondence. Box 715, Electric Refrigeration News.

FRANCHISES AVAILABLE

DISTRIBUTORS: DEALERS. Buy fully reconditioned refrigerators as low as \$25. Hundreds of nationally advertised electric refrigerators priced right for retail resale. Write for booklet containing specifications and prices for domestic and export trade. Our reputation in the trade is an assurance of A-1 merchandise. Look for our label "Remanufactured by Federal Refrigerator Corp., 435 11th Ave., New York."

FRANCHISE WANTED

COMMERCIAL REFRIGERATING EQUIPMENT: European manufacturer wants connection with compressor factory for delivery of bare two-cylinder compressors with flywheel, suction and discharge valves; condenser factory for delivery of different sizes air-cooled condensers for methyl chloride. Lowest quotations for shipments of 100 compressors with drawings and particulars. Box 692, Electric Refrigeration News.

EQUIPMENT FOR SALE

REBUILT Mayson expansion valves, \$1.00. Rebuilt American Radiator expansion valves, \$1.65. Ranco controls, all types, \$1.95. Frigidaire and Kelvinator dry and flooded coils, \$1.50 up. Rebuilt domestic and commercial units, \$12.50 up; all sizes from 1/2 HP. to 1 1/2 HP.; thoroughly rebuilt, fully reconditioned. Federal Refrigerator Corp., 437 11th Ave., New York.

CABINETS—Household and commercial—new and factory seconds—high grade manufacturer—attractive prices—4, 5 and 6 cu. ft. lacquer exterior—10, 12 and 15 cu. ft. all porcelain domestics—18 models commercial cabinets—immediate delivery—write or wire for literature and prices—Midwest Stamping & Enameling Company, Morrison, Illinois.

ISOBUTANE: We offer purest and dryest isobutane for the most exacting scientific purposes; in your 80 lb. cylinders at \$0.75, in our 120 lb. cylinders, \$0.70, in small lots at \$1.00 per pound. The Standard Refrigeration Co. of Pittsburgh, 1148 Dohrman St., McKees Rocks, Pa.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. Van Deventer (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

REPAIRS

HALELECTRIC thermostat repair service. B & B, G.E., Cutler-Hammer, Penn. Ranco, Tag, etc. Expansion valves repaired. Gas service, Ethyl, Methyl, Isobutane, Sulphur. Your cylinder or ours. Competitive prices. Halelectric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

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Exactly the way you want them trained, Mr. Executive

Utilities Engineering Institute's course of training in installing and servicing all types of refrigeration equipment was prepared with the cooperation of leading Engineers and Executives in the industry. We asked . . . "What training do you want your employees to have, to make them most capable and efficient?"

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8 cu. ft. capacity, 2 tray. Complete with lowside floats, service valves, and cube trays.	1/6 & 1/4 H.P. Complete Highsides with 110v-AC 60 cycle motors.	S-20 TS-G \$25	Jr-12800 \$20.00
Frigidaire STF-110TF-115TF \$3.75	Riser Valves 1/4"-3/8" or 1/2" 50¢ each.	COPELAND F-G-H \$19	A-AA-AB \$22.50
Kelvinator 08V-08H \$2.75		SERVEL No. 1, No. 21 \$15	ZEROZONE-A (as illus.) \$20
Fedders L28 (as illustrated) \$2.75			B-S-118 D-110
SO2 or Methyl \$3.50			
Float valves for the above \$1.75			

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	Electric Refrigeration News (weekly)	1935 Refrigeration Market Data Book (2 volumes)	Both Electric Refrigeration News and Refrigeration Directory
1 subscription	\$3.00	\$5.00	\$6.50
5 or more each	2.75	4.50	6.50
10 or more each	2.50	4.00	6.50
20 or more each	2.25	3.50	5.75
50 or more each	2.00	3.00	5.00
75 or more each	1.75	2.50	4.25
100 or more each	1.50	2.00	3.50
For All Other Countries (Except Canada)			
1 subscription	\$5.00	\$6.00	\$9.00
5 or more each	4.75	5.50	8.50
10 or more each	4.50	5.00	8.00
20 or more each	4.25	4.50	7.50
50 or more each	4.00	4.00	7.00
Canadian Rates (including tariff of 5 cents per copy on the News)			
1 subscription	\$6.00	\$6.00*	\$11.00*
5 or more each	5.75	5.50*	10.50*
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50 or more each	5.00	4.00*	9.00*

*Canadian subscribers are required to pay a tariff and excise tax on the Directory and Market Data Book which amounts to \$2.59. These extra charges on books will be collected by the Canadian postoffice at the time of delivery.

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Street Address City and State

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7-31-35